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The Illustrations will be issued shortly in the Second volume.

THE
**SURGICAL INSTRUMENTS
OF THE HINDUS**

WITH

**A Comparative Study of the Surgical Instruments of
the Greek, Roman, Arab and the Modern
European Surgeons.**

BY

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TO
THE HON'BLE
SIR ASUTOSH MUKHOPADHYAY, Kt.,

Saraswati, Sastra-vachaspati,

C.S.I., M.A., D.L., D.Sc., F.R.A.S., F.R.S.E., F.A.S.B.,

**Judge of the High Court of Judicature at Fort William
in Bengal,**

VICE-CHANCELLOR, CALCUTTA UNIVERSITY,

Ex-President of the Asiatic Society of Bengal,

AND

Chairman of the Board of Sanskrit Studies,

**In recognition of his love of Science, his pre-eminent services to the cause
of University Education, his administrative ability, and his generous
liberality to scholars**

AS WELL AS,

In grateful remembrance of many acts of kindness,

THIS VOLUME IS

DEDICATED

BY

THE AUTHOR

P R E F A C E .



For researches into the state of medicine among the Ancient Hindus, we have several sources of information to scrutinise. The remarks of Dr. Payne regarding the sources of information of Anglo-Saxon Medicine may apply here with still greater force.¹

First is the evidence of contemporary literature about the craft of physicians and surgeons, since we are sure that there has always been a class of medicine men of one kind or another. Thus we find in the R̄gveda, the use of artificial limb as a substitute for a limb accidentally lost². From the Mahābhārata,

¹ Payne's English Medicine in the Anglo-Saxon Times, P. 7.

² चरित्रं हि वेरिवाच्छेदि पर्णम्

आजा खेलस्य परितक्षग्रायाम् ।

सद्यो जंडग्रामायसौं विशपलायै

धने हिते सर्तवे प्रत्यधन्तम् ॥

R̄gveda—15th Rk., 1st Mandala, 116 Sūkta.

अगस्त्य पुरीहितः खेली नाम राजा तस्य सम्बिनी विशपलानामस्ती, संयामे शत्रुभिः क्षिन्नपदा आसीत् । पुरीहितेन अगस्त्येन स्तूतौ अधिवनौ रात्रौ आगत्य आयोमयं पादं समधन्ताम् । तदेतदाह 'आजा'—आजौ, संयामे, अगस्त्य पुरीहितस्य—खेलस्य राजतः सम्बिन्नाः विशपलाख्याया, 'चरित्रं'—चरणं, 'वेरिव'—वे: पक्षिणः, 'पर्णं' पतञ्चम् इव, 'अच्छेदि हि'—पूरा द्विन्नमभूत् खलु । हि अधिवनौ ! युवां अगस्त्येन स्तूतौ सन्तौ, 'परितक्षग्रायां'—रात्रौ, आगत्य, 'सद्यः'—तदानीमेव, 'सर्तवे'—सर्तूं गन्तुम् इत्यर्थः, विशपलायै 'आयसौ';—लौहमयीम्, 'जड्डग्रां'—जड्डीपलचितं पादम्, 'प्रत्यधन्तम्'—सम्बन्ध एकीकरणमित्यर्थः क्लतवन्तौ ।

we learn that when Parīkṣit, the king of the Kurus, became certain of his approaching death by snake-bite, due to a curse uttered by a sage, he tried to protect himself by the constant attendance of a number of physicians, who were well supplied with antidotes.¹ Again it is stated that when the great warrior Bhīṣma was wounded in war, the skillful army surgeons came to him with the necessary medical and surgical appliances to treat his wounds.² From the Mohāvāgga, we learn that Jīvaka, the personal physician of Buddha, practised cranial surgery with success.³ In the Mālavikāgnimitra, we find the use of charms—a signet

¹ संमन्वय मन्त्रिभिश्चैव स तथा मन्त्रतत्त्ववित् ।
प्रासादं कारयामास एकस्तम्भं सुरचितं ।
रक्षाञ्च विदधे तत्र भिषजशौषधानि च ।
ब्राह्मणान्मन्त्रसिद्धांश सर्वती वैन्योजयत् ।

Mahābhārata, Adi Parva, Ch. 42.

² उपातिष्ठन्थी वैद्याः शत्रूहरणकीविदाः ।
सर्वोपकरणैर्युक्ताः कुशलैः साधु शिचिताः ।
तान् दृक्षा जान्हवीपुत्रः प्रीवाच तनयं तव ।
धनं दत्त्वा विसञ्जन्ता पूजयित्वा चिकित्सकाः ।
एवं गते मर्येदानीं वैद्यः कार्यमिहासि किं ।
चतुर्धर्मे प्रशस्तां हि प्राप्नीऽस्मि परमां गतिं ।
नैष धर्मो महीपालाः श्रतत्पगतस्य मे ।
एभिरेव शरैश्चाहं दग्धव्योऽस्मि नराधिपाः ।
तच्छुला वचनं तस्य पुच्छी दुर्योधनस्त्रव ।
वैद्यान् विसर्जयामास पूजयित्वा यथाऽर्हतः ।

Mahābhārata, Bhīṣma Parva, Ch. 121,

Vs. 5745—5750. (A.S.B. Ed.)

³ Mohāvāgga, VIII. 1.18.

ring as a healing talisman for the cure of snake-bite;¹ and also we find there a reference to a class of physicians who specialised themselves in Toxicology (*Viṣa-Vaidya*),² and were held in high esteem for their professional skill by the public.³ From the *Bhojaprabandha*, the administration of some kind of anaesthetic by inhalation before surgical operations can be ascertained. Similarly from the books of Law, we know the relations of the profession to society in general. In the *Manusamhitā*, we have unmistakable testimony of the decline of Hindu surgery as the author prohibits the eating of cooked rice from the hands of a surgeon.⁴

¹ सहि ! देवै इदं सिप्पिसआसादो आनीदण्णागमुद्दासणाहं अङ्गुलीत्रअं सिणिं हणभालत्रन्ती तूह उवालम्भे पड़िदत्ति ॥

Mālavikāgnimitra, Ch. I.

जय ।—जेदु जेदु भटा । धुवसिङ्गी विलुवेदी । उदकुम्भविधारण सप्यमुद्दिशा कपिदब्बा । ता अणेसीत्रदुत्ति । धारि ।—एदं सप्यमुद्दिशम् अङ्गुलीत्रअम् । पच्छा मह हत्ये णम् ।

Ibid, Ch. IV.

² परि ।—क्रेदो देशस्य दाही वा चतस्यारक्तमीक्षणम् । एतानि दष्टमात्राणामायुष्याः प्रतिपत्तयः ॥ (संप्रति विषवैद्यानाम् कर्म ।)

राजा ।—जयसेने ! धुवसिङ्गिः चिप्रमाहयताम् ॥

Ibid, Ch. IV.

³ निपु ।—पस्तमुहवणी दीसदि । अवि अ धुवसिङ्गिणा चिद्दसिदी । मा से असङ्गणिङ्गं पावं ॥

Ibid, Ch. IV.

⁴ चिकित्सकान्देवलकान्मांसविक्रयिणलथा ।

विपणेन च जीवन्ती वर्जाः स्युर्हव्यक्ययोः ॥

Manusamhitā, Ch. III, 152.

चिकित्सकस्य स्तगयोः क्रूरस्त्रीच्छिष्ठभीजिनः ।

उग्रान्तं मूत्रिकान्तं च पर्याचान्तमनिर्दशम् ॥

Ibid, Ch. IV, 212.

Secondly, monuments or inscriptions scattered about the country have to be searched, as references found therein to the science of medicine, are more trustworthy than documents which may have been more or less tampered with by interpolations of subsequent writers. Thus we learn from the Edicts of Aśoka, that hospitals were established by him in different parts of his kingdom, not only for the treatment of suffering humanity but also for the brute creation¹.

Thirdly, personages and scenes in connection with medical practice, and figures of herbs may have been represented in works of art which must be thoroughly examined. But unfortunately we do not possess any such work of art and so we can learn nothing to our purpose from this source. In the interpretation of the subject of the Friezes of the Rani Naur and Ganesha's Cave, Dr. R. L. Mitra says,—“The shampooing in the Ganesa Cave may be for a parent, but the close seat with the right hand round the neck of the male personage in the other, would be highly unbecoming in an unmarried female. But if the stooping figure be taken to be that of a wounded man, a wounded priest for instance, the lady may be a maiden nursing him without any offence to propriety. It is true that the appearance of the figure on the mattress does not indicate suffering from a wound, but in the Rani Naur frieze, the stooping head affords some indication of it.”²

पूयं चिकित्सकस्यान्नं पुंश्ल्यास्त्वन्नमिन्द्रियम् ।
विष्टा वार्षूषिकस्यान्नं शस्त्रविक्रियणी मलम् ॥

Manusāṁhitā, Ch. IV, 220.

¹ Rock Inscriptions, Edict II.

² The Antiquities of Orissa, Vol. II, p. 11.

Fourthly, the various kinds of surgical instruments preserved in museums are to be examined and the reports of finds of surgical appliances in various localities are to be studied. We know what a flood of light has been thrown on ancient Greek surgery by the steady progress of archæological discovery and finds of instruments at Pompeii, Herculaneum and elsewhere, and by the study of the specimens preserved in the Naples museum, the Athens museum and other museums of Europe. But as far as I have been able to trace, our museums contain no finds supplying us with any information on the subject.

Fifthly, the literature of medicine itself should be thoroughly inquired into and excerpts elucidative of our subject should be compared with one another. "The detailed descriptions of the very numerous Hindu instruments not being very minute or precise, Professor Wilson says, we can only conjecture what they may have been, from a consideration of the purport of their names, and the objects to which they were applied, in connection with the imperfect description given."¹ We are fortunate, however, in possessing a copious medical literature of great merit from very early times. We shall describe the important books in the introductory chapter, with short notices of their authors.

Sixthly, the comparative study of the science at the same period in other countries also furnishes us with valuable materials as regards the state of medicine in a country. It is well known that Sanskrit works are often written in a very terse language

¹ Royle's Antiquity of Hindu Medicine, foot-note, p. 59-60.

and it might be said with greater truth about the works of early Sanskrit authors, the comment of a learned critic about the style of Thucydides, the famous historian,—“the most obvious and characteristic of his peculiarities is an endeavour to express as much matter as possible in as few words as possible, to combine many thoughts into one, and always to leave the reader to supply something of his own. Hence his conciseness often becomes obscure.” I could not form any idea as to the shape of some of the surgical instruments from the descriptions given in the text books, and the commentators are often silent on those passages. But when I read the accounts of similar instruments in Greek and Roman literature, my difficulties at once cleared up. We know with what brilliant results comparative mythology and comparative philology have been studied of late years, and I am sure that a comparative study of medical science by scholars will lead to interesting discoveries. So I have added descriptions of the instruments according to the Greeks, Romans and Arabs at the end of the descriptions given in Sanskrit books : the former serving as commentaries on the latter.

Seventhly, in the accounts of historians, travellers and pilgrims from foreign countries, may be found notices of medical science, as they saw it practised during their sojourn in a country, and such impressions, if properly collated, may bear impartial testimony to the progress of the science at the time. Again, we must enquire if the original treatises of medicine can be proved to have been translated into different languages and whether the remedial agents of a country can be traced in the Pharmacopœias of different nations. Thus we

learn from the accounts of Houen Tsang and Fa Hian that charitable institutions such as hospitals, dispensaries and Pûnyasâlâs (Houses of Charity) were quite common in ancient India.¹ Arrian informs us in his *Indica* that the study of medicine among the Brahmans was in great favour.² We know that the standard works on medicine were translated in Arabic in the 8th Century B. C.,³ and that various medicinal herbs of Indian origin found their way into the Greek *Materia Medica*.⁴

Eightly, we must enquire whether the medical practice of ancient times is still resorted to by the physicians of the present days. The Hindu system of medicine is still being practised all over India, more or less in its original form, and so can still be studied at first hand. But for our present purpose, we derive little or no help from the *Vaidas* of the present generation. They know practically nothing about anatomy and surgery which began to decline during the Buddhist era, and finally all vestiges of the science became lost during the Mahomedan rule. I have spared no pains to exhaust these sources of information so far as surgical instruments are concerned. Whether or not I have been fortunate enough to give just the necessary details of instruments from the best accessible authorities without at the same time loading my pages with superfluous matter, must be left to the judgment of my readers to determine.

¹ Beal's Buddhist Records of the Western World, Vol. I., P. 165, 198 and 214; Vol. II., p. 188 and 303.

² Arrian's *Indica* c. 27.

³ Alberuni's India, Sachau's Preface, p. XXX—XXXI.

⁴ Royle's Antiquity of Hindu Medicine, p. 77-113.

Now it may be asked why the Science and Art of Surgery, which was successfully practised in Ancient India, is so much neglected by the present generation of *Vaids*. So let us consider the causes that led to the downfall of Hindu Surgery :

1. The Hindus from a very early period have given up the dissection of human bodies—the only trustworthy method of acquiring anatomical knowledge—merely because it may occasion ceremonial uncleanliness. The Ancient Hindus were, however, free from such prejudices. Manu lays down that mere bathing will purify a Brahman who has touched a corpse,¹ whilst stroking a cow or looking at the Sun, having only sprinkled his mouth with water will remove the defilement due to touching a dead bone.² But even in the *Manusamhitā*, we can trace the decline of Hindu surgery, and his law forbidding any one from eating food from the hands of a doctor evidently refers to a surgeon.³

2. The interference of the priests in India, as in Europe played an important part. They began to cure diseases by spells, charms, texts and drugs; and temples have served as consulting rooms for the treatment as much of the diseases

¹ दिवाकीर्तिमुदकां च पतितं सूतिका तथा ।

श्रवं तत्स्यृष्टिनं चैव स्फृङ्गा स्नानेन गुण्यति ॥

The Institutes of Manu, Ch. V, 85.

² नारं स्फृश्यस्थि सस्तेहं सात्वा विप्रो विशुद्धति ।

आचम्येव तु निस्तेहं गामालभ्यार्कमीद्यवा ॥

Ibid, Ch. V, 87.

³ Ibid, Ch. III, 152 ; Ch. IV, vs. 212 and 220.

of the body as of the soul. The example of such a temple we still find in Tārakeśvar where many sick people repair to have their maladies cured by dreams, hypnotic suggestions and incubation or temple-sleep. Similar practice was prevalent in Egypt and Greece in olden times. The modern practice of using galvanic rings and abdominal belts is merely an advanced method of indulging in superstitious ideas.

3. The patients always dreaded the surgeon's knife—especially when the use of a general anæsthetic was unknown. At the same time, the comparative success of poultices, actual and potential cauteries, and other external applications have influenced the lay mind that operations by knife are not always needed.¹ The Hindu surgeons themselves believed in similar tenets, for Suśruta, the surgeon, remarks that "of all cutting instruments and their substitutes, caustics (or vegetable alkalies) are the most important, because by means of them, deep and superficial incisions and scarifications may be made, and derangements of the three humours (air, bile and phlegm) may be rectified"; and again he says that "with

¹ दिव्यौषधिं विना देवि शस्त्रविद्या सुनिष्कला ।
वैरूप्यं कुरुते या च दुश्चिकित्स्ये व्यधान्तरे ॥
जायन्ते हि यथार्शसि पाटितानि पुनः पुनः ।
किं तत्र शस्त्रसाध्यं स्यात् सुसिद्धैभैषजैर्विना ॥
धातुनां व्यापदि यच्च भेषजं नैव सिद्धति ।
द्याभये दुर्सरे तस्मिन् शस्त्रमेव विधीयते ॥
पुनः संशमनं तत्र धातुनाम् हि प्रशान्तये ।
प्रदातव्यं महादेवि शस्त्रादर्चाक् ब्रवीमि ते ॥

regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not reappear, and because it can cure diseases which are incurable by medicines, instruments and caustics.”¹ Thus we see that the Hindus were partial to external applications as a cure of surgical diseases, and gradually they neglected the surgical operations—one of the most important means of acquiring knowledge in Morbid Anatomy and of testing the correctness of diagnosis, in the absence of the post mortem examinations of the cadavers. Thus not only surgery but medicine also suffered materially.

4. The Hindus always cherish a high regard for the writings of their sages, and the earliest works on medicine became the standard works and were held sacred. Any violation of their opinions was considered a sacrilege ; and all knowledge thus soon became stereotyped. In later times, none dared to question the validity of the statements contained therein, and though about three thousand years have elapsed, and though the votaries of the science are still honoured and wellpaid, the science instead of improving has markedly deteriorated. In fact, only two authors—Caraka and Suśruta—are original; the later authorities—and there is a vast number of them—were merely their servile copyists who only differed from them when they indulged in some grave errors. We have a parallel in the history of medical science in Europe, where Galen

¹ चारादग्निर्गरीयान् क्रियासु व्याख्यातस्तद्ग्धानां रोगानामपुनर्भावाङ्गेषजशस्त्रकारै-साध्याना तत्साध्यताच ।

held his sway over the profession for about two thousand years.

5. One of the potent causes of progressive decadence in the knowledge and practice of surgery amongst the Hindus is the rapid spread of Buddhism in India. Though Buddha sanctioned the use of the lancet in some cases, in cases of a doubtful nature he prohibited the use of instruments in the treatment of even surgical diseases. For example, he allowed the surgical treatment of boils by knife,¹ but he prohibited not only the use of the lancet for treatment of fistula-in-ano but the use of clysters also.² As it would be interesting to know the reasons of this prohibition, I quote the story in full from the *Mohāvāgga* (*Sacred Books of the East*):³

1. Now when the Blessed One had remained at Sâvatthi as long as he thought fit, he went forth on his journey to Râgagaha ; and wandering straight on he arrived at Râgagaha; and there at Râgagaha he stayed at the Veluvana in the Kalandaka-nivâpa.

Now at that time a certain Bhikkhu was suffering from fistula. And the physician (named) Âkâsa-gotta lanced it. And the Blessed One when he was going round through the sleeping-places came to the place where that Bhikkhu dwelt.

2. Âkâsa-gotta, the physician, saw the Blessed One coming from afar ; and when he saw him he said to the Blessed One : ' Let the venerable Gotama come and look at this Bhikkhu's orifice ;

¹ *Mohāvāgga*, VI. 14. 4 & 5.

² *Ibid*, VI. 22. 3.

³ *Ibid*, VI. 22.

it is like the mouth of an iguana!' And the Blessed One thinking, 'This foolish fellow is making fun of me,' kept silence and turned away. And in that connection, and on account of that, he called a meeting of the Bhikkhu-samgha, and asked the Bhikkhus: 'Is there, O Bhikkhus, in that Vihâra a Bhikkhu who is sick?'

'There is, Lord.'

'What is the matter, O Bhikkhus, with that Bhikkhu?'

'That venerable one, Lord, has a fistula, and Âkâsa-gotta the physician, has been lancing it.'

3. The Blessed Buddha rebuked (that Bhikkhu), saying, 'This is improper, O Bhikkhus, for that foolish one, unbecoming, indecent, unworthy of Samanas, not allowable and ought not to be done. How can this foolish fellow, O Bhikkhus, allow a surgical operation to be performed in that part of his body? The skin there, O Bhikkhus, is tender, the wound is difficult to treat, the knife is difficult to guide. This will not redound, O Bhikkhus, to the conversion of the unconverted.'

And having rebuked him, the Blessed One, after delivering a religious discourse, said to the Bhikkhus: 'You are not, O Bhikkhus, to allow a surgical operation to be performed upon you in that part of your bodies. Whosoever allows that, is guilty of thullakkaya offence.'

4. Now at that time Khabbaggiya Bhikkhus, since a surgical operation had been forbidden by the Blessed One, used a clyster.

They told this thing to the Blessed One.

'Is it true, as they say, O Bhikkhus, that the Khabbaggiya Bhikkhus use a clyster ?'

'It is true, my Lord.'

He rebuked them, and having delivered a religious discourse, said to the Bhikkhus : 'No surgical operation is to be performed within a distance of two inches round the anus, and a clyster is not to be used. Whoever does so, is guilty of a thullakkaya offence.'

And thus we find that Jīvaka, the famous surgeon, is said to have cured a case of fistula-in-ano by the single application of an ointment.¹ The operation fell into such disuse that when Śaṅkarāchāryya suffered from the same disease, no surgical aid was thought necessary by the physicians, though it is said that he was treated by renowned doctors of the time.²

From Megasthenes, we learn that "among the Sarmans the Hylobioi (living in woods) were held in most honour, and next to them the physicians, who are mendicants and also ascetics, like the class above them and the class below them,

¹ "And Gīvaka Komārabhakka healed the fistula of the Magadha King Seniya Bimbisāra by one anointing."

Mohāvāgga (Sacred Books of the East), VIII. 1. 15.

² अचिकित्स्यभगन्दरात्यरीगप्रसरक्षीणितपङ्गिलखशाश्वां ।

अजुग्पस्यविशेधनादिरूपां परिच्छामक्षताऽस्य तीटकार्यः ॥

* * * * *

निगदिते मुनिनेति भिषग्वरा विदधिरे वहृधागदसत्क्रियाः ।

न च शशास गदीवहुतापदोविमनसः पटवी भिषजीऽभवन् ॥

which consisted of sorcerers and fortune-tellers;¹ and Strabo² mentions that these physicians "cured diseases by diet rather than by medicinal remedies, which were chiefly unguents and cataplasms."³

6. No science can flourish without the support of the government of the day. The Hindus became a subject race; and any departure from the traditional store of knowledge in the shape of improvement in the quality and additions to its quantity was neither tolerated by the people, who are proverbially conservative, nor countenanced by the royal court, for the conquerors brought with them and patronised their own hakeems and doctors. Neither the Mahomedans nor the English have taken any real interest in the Indian Medical Science from preconcieved notions that it contains nothing worthy of their perusal. The *Kavirajes* again are so conservative in their opinions that they can not boldly advocate even the use of such drugs as are of unquestionable value in the treatment of diseases, as for example the use of Quinine in Malaria. To this may be contrasted the behaviour of Bhāvamiśra, who lived about three hundred years back and who adopted many medicaments of foreign origin. The consequence can easily be imagined, and in the language of Elphinstone, can be thus described: "Physicians follow the practice of their instructor without inquiry, and surgery is so far neglected, that bleeding is left to the barber, bone-setting to the herdsman, and every one is ready to administer

¹ The Invasion of Alexander the Great. M'Crindle. Appendices. p. 358.

² Geography, XV. i. 58-60.

³ The Invasion of Alexander the Great. M'Crindle. Appendices. p. 368-69.

a blister, which is done with the juice of the euphorbium and still oftner with the actual cautery.”¹

But we need not enlarge any further. The object of this essay is not to write out an exhaustive dissertation on the Hindu medical science but by a few suggestive facts, however imperfect and fragmentary, to stimulate curiosity and divert attention of the diligent scholars to a vast field of research, which seems as yet to have been only partially explored.

It is proper here to acknowledge that I have on all occasions freely availed myself of the labours of Drs. Wise, Thakore Saheb of Gondal, and the translators of Suśruta Samhitā in the Bibliotheca Indica, namely, Dutt and Hoernle. It is a great pity that this translation has not as yet progressed beyond three fasciculi. Hoernle’s recent contribution, “Osteology of the Hindus,” is a move in the right direction and we hope it to be followed by similar enquiries in other branches of the science. Royle for the first time proved beyond doubt the high antiquity of Hindu medicine, and established its right position in the history of the science. Wise is the pioneer of systematic research in this field of study, and his sympathetic appreciation of the Hindu system of medicine will always be remembered with gratitude by our countrymen. Dutt’s Materia Medica of the Hindus is a work of great merit; and I have derived material assistance from the excellent treatise, “History of Aryan Medical Science,” by the Thakore Saheb of Gondal. Dr. Ray’s History of Hindu Chemistry is a valuable contribution in the cognate subject of chemistry. I have borrowed from these writers largely, but

¹ Elphinstone’s History of India, 5th Ed., p. 160.

I flatter myself it will also be found that I have further collected from various sources a store of valuable information, for which I am in no way indebted to any of my predecessors in the same field of research. The descriptions of the surgical instruments of the Greeks, the Romans and the Arabs, I have taken from the excellent English translations of Paulus Aegineta, the Extant Works of Aetius and the Genuine Works of Hippocrates, prepared by the renowned Adams, for the Sydenham Society. I have also laid the recent monograph, "Surgical instruments in Greek and Roman times" by Dr. Milne, largely under contribution; I only regret that I had no access to the book a little earlier, otherwise much of my labour in search for descriptions of the instruments of the Greeks would have been saved. For the last five years, I have been engaged on this investigation and it was when I had nearly finished, that Milne's book was mentioned to me by the Hon'ble Mr. Justice Asutosh Mookerjee, the Vice-Chancellor of the Calcutta University and the President of the Asiatic Society of Bengal.

To complete the subject, I have added plates of nearly all the varieties of instruments; but they are more or less hypothetical as we do not possess any actual specimens of the instruments of the Hindus. Written descriptions of surgical instruments are uninteresting and often fail to convey the true idea, which could be easily made evident by the pencil. For purposes of comparison I have given drawings of instruments of the Greeks, the Romans and the Arabs, when I thought that they might be of value for the proper elucidation of my subject. I am indebted to many authors

I am indebted to many authors for some of the engravings of the instruments. I have been eareful to give the souree whence the borrowed ones are taken, as far as I have been able to aseertain them. If this has been omitted in any ease, it is from inadvertence, not from design. My best thanks are due to them and I here aeknowledge my indebtedness to the authors for availing myself of their labours without their permission. But many new illustrations will be found, and I have appended my name to those drawn by myself. These figures of the surgieal instruments would be fonnd to tally better with the descriptions of the instruments given in the Sanskrit books than the illustrations of the previous authors. The drawings of surgical instruments as given by me wouold look more like the figures in a modern catalogue of surgieal instruments. Some of my friends could hardly believe when they saw the plates that these instruments were known to the aneient Hindus at such an early age. This feeling of amazement and incredulaty as regards the surgical instruments used by the aneient Hindus has its parallel in the observations of Billroth¹ about the surgical instruments found in the excavations at Pompeü and now preserved in the museum at Naples. He says : " It made a peculiar impression upon me, when I saw before me this two thousand years old surgical armamentarium of a Roman colleague, differing but slightly in the form of the more ordinary instruments from those of our time. *Ars longa vita brevis.*" Milne² also remarks : " The works of those (Paré, Scultetus and Heister) are profusely illustrated with instruments, some of whieh ean plainly be seen to tally exactly with the descriptions of the classieal authors."

¹ Billroth's Surgery, Vol. I, Introduction, Page 7. Syd. Soc. Ed.

² Græco-Roman Surgical Instruments, P. 8.

In describing the surgical instruments, I have confined myself strictly to the texts of the authors and commentators whom I have quoted, and have given the original Sanskrit passages in the foot-notes. These will be of great help to scholars who will try to study the subject at first hand, and prosecute further historical inquiries. The references in the foot-notes do not refer to pages of any particulars edition of the work, as such pagination causes inconvenience to the readers who may not secure the edition in question; so we have given the section, and chapter of the book which will be found in any edition.

In the translations of Sanskrit passages, I have endeavoured to follow the original as closely as possible, except where a somewhat free rendering was necessary to make the meaning clear.

The dates of the ancient Hindn authors of Sanskrit medical books cannot be ascertained with certainty. In the first chapter I have endeavoured to discuss briefly their approximate ages. But as I have compared the surgical instruments of the ancient Hindus with those of the Greeks, Romans and Arabs, a concise summary of the chronological dates of the Græco-Roman, Arab, and the later authors would be a great help in the proper elucidation of my text.

<i>Authors.</i>	<i>Date.</i>
Pythagoras	... 580-504 B.C.
Megasthenes	... 300 B.C.
Ktesias	... 400 B.C.
Hippocrates	... 460 B.C.
Hero of Alexandria	... 285-222 B.C.

<i>Authors.</i>	<i>Date.</i>
Dioseorides	... First century A.D.
Celsus	... 25-30 B.C. to 45-50 A.D.
Seribonius Largus	... 45 A.D.
Soranus	... First century A.D.
Rufus of Ephesus	... 98-117 A.D.
Galen	... 131-201 A.D.
Marellus Empiricus	... 300 A.D.
Antyllus	... 3rd century, A.D.
Oribasius	... 326-403 A.D.
Theodore Priscianus	... 4th century A.D.
Caelius Aurelianus...	... 4th or 5th century A.D.
Moschion	... 5th century A.D.
Actius...	... 5th century A.D.
Alexendar of Tralles	... 525-605 A.D.
Paulus Ægineta	... 660 A.D.
Serapion	... 800 A.D.
Rhazes	... 850-932 A.D.
Haly Abbas	... After 950 A.D.
Avicenna	... 980-1037 A.D.
Abul Cassim	... x 1106 A.D.
Avenzoar	... x 1162 A.D.
Paré ...	... 1509-90 A.D.
Scultetus	... 1650 A.D.
Heister	... 1739 A.D.

I can not suffer this work to go forth without offering at least an explanation of, if not an apology for, the delay which has occurred in the publication of this thesis. It is mainly due to the accidental fire which reduced the types and the blocks

for this work to ashes and destroyed a part of the manuscript. This portion had to be written again. Again the task of reading proof sheets was laid on me entirely. The occupation of a laborious profession encroached on my time; and I was not fortunate enough to secure the co-operation of any worker in this field of research. The result might be anticipated and no one is more conscious of the unsatisfactory issue than myself. I had no experience in proof reading, and so mistakes are not uncommon. Some of the errors will be found corrected in the corrigenda. As regards the corrections of many of the proof sheets of the Sanskrit foot-notes I was assisted by my son Hirendranāth Mukhopādhāya, who helped me much in getting this book completed. The author will feel obliged if informed of any errors that may be detected and of references to informations which ought to have been given, and also for any hints that may make a future edition more useful to the readers. But I have this consolation in my mind that I have not pushed this work through the press hurriedly or prefunctorily and I have done my best. I have laboured with the usual drawbacks of an active professional life and if this be admitted by the critic as an excuse for errors and failures, I shall be grateful to him.

A copious index has been provided for this work, whereby anything material in the whole book may be readily found out; of which it may be said that it wants no other advantages than such as the author had not power to give.

It would not be out of place here to mention that part of this essay was read before the Asiatic Society of Bengal in June, July and August, 1908. The learned President in his annual address remarked as follows: "In the course of the last

session Dr. Girindranath Mukerjee submitted to the society a paper of considerable extent, in which he elaborately examined the subject of the surgical instruments of the ancient Hindus. The questions he has raised, as to the priority of Hindu medicine over that of the Greeks, the Romans and the Arabs, are likely to arouse controversy, but in whatever way the question of priority may be decided, it seems to me truly remarkable that the descriptions given in our most ancient books on medicine, of the surgical Instruments then in use, should bear a close resemblance to the descriptions given not only in Greek, Roman and Arab medical writings but in many cases with the descriptions given in modern works on surgery. I trust that this subject, so peculiarly Indian, will not be left alone and will receive the attention from investigators which it undoubtedly deserves."¹

As regards the transliteration of Sanskrit words, we have employed the method adopted in the Congress of Orientalists and circulated in the Journal of the Royal Asiatic Society, ignoring in fact, the unpleasant characters of the Sacred Book of the East.

¹ Journal and Proceedings of the Asiatic Society of Bengal, Vol. V, 1909,
Annual Address, p. XXX.

I

SANSKRIT AND ALLIED ALPHABETS.

ਅ	.....	a	ਐ	.....	o	ਟ	.....	t	ਕ	.....	b
ਆ	.....	ā	ਐਊ	.....	au	ਠ	.....	th	ਮ	.....	bh
ਇ	.....	i	ਕ	.....	k	ਡ	.....	d	ਸ	.....	m
ਈ	.....	ī	ਖ	.....	kh	ਢ	.....	dh	ਯ	.....	y
ਉ	.....	u	ਗ	.....	g	ਣ	.....	n	ਰ	.....	r
ਊ	.....	ū	ਘ	.....	gh	ਤ	.....	t	ਲ	.....	l
ਕਹ	.....	r	ਡ	.....	ñ	ਥ	.....	th	ਵ	.....	v
ਕਹੂ	.....	ṛ	ਚ	.....	c	ਦ	.....	d	ਸ਼	.....	ś
ਲਾਈ	.....	l	ਛ	.....	ch	ਧ	.....	dh	ਧ	.....	ṣ
ਲਾਈ	.....	l	ਜ	.....	j	ਨ	.....	n	ਸ	.....	s
ਏ	.....	e	ਝ	.....	jh	ਪ	.....	p	ਹ	.....	h
ਐ	.....	ai	ਐੜ	.....	ñ	ਫ	.....	ph	ਲ	.....	l

(*Anusvāra*) . . . in

s (*Avagraha*) . . . ’

• (Anunāsika) . . m

Udātta ↗

: (*Visarga*) . . . h

Svarita 스

\times (*Jihrānūliya*) . *h*

Anudatta 2

३ (Upadhanānīya) hy-

CONTENTS.

	PAGES.
PREFACE	i—xxii
Sources of information : contemporary literature ; monuments and inscriptions ; figures of herbs and scenes of medical praetice ; museums ; medical books ; comparative study ; accounts of historians, travellers and pilgrims ; medical practice of the present time. Downfall of Hindu Surgery : causes : discontinuance of dissection ; interference of priests ; dread of the surgeon's knife ; authority of the ancient sages ; Bud- dhism ; want of Government help. Acknow- ledgment. Chronological dates of the Græco- Roman, Arab and later authors. Transliteration. of Sanskrit words.	
CONTENTS	xxiii—xxix
CORRIGENDA	xxx—xxxii
WORKS BY THE AUTHOR	xxxii

CHAPTER I.

INTRODUCTION	1—33
Ancient medical authors and their works : Āyur- veda ; Atharvaveda ; Caraka Saṁhitā,—age of Caraka, editions and commentaries ; Suśruta Saṁhitā—Dhanvantari, Suśruta, Nāgārjuna,— age of Suśruti, Candrāṭe, Pālakāpya,—editions	

and commentaries. Vāgbhaṭa I,—Aṣṭāṅga Saṅgraha, his age, edition and commentary; Vāgbhat II: Aṣṭāṅga Hṛdaya Saṅhitā, editions and commentaries ; Vagbhaṭā III—Rasa Ratna Saṃuccaya ; Mādhavakara :—Nidāna ; Vṛnda Madhava :—Siddhayoga ; Cakrapāṇidatta :—Cikitsāsāra Saṅgraha, editions ; Śāraṅgadhara:—Śāraṅgadhara Saṅgraha, editions and commentary ; Bhāva Miśra :—Bhava Prakāśa, editions.

CHAPTER II.

HOSPITALS AND DISPENSARIES	34—60
----------------------------	-----	-----	-------

Hospital in the Caraka Saṅhitā ; Greek iatrium ; list of appliances in surgical operations ; the lying-in-room ; the child's room ; room for operated cases ; the kitchen ; qualities of a good patient and a good nurse ; Charitable hospitals during the reigns of Aśoka and Śilāditya II ; Puṇyaśālās ; animal hospital ; opinions of ancient sages as to the merit of the founder of a hospital ; Dispensaries ; Anæsthetics.

CHAPTER III.

MATERIALS OF INSTRUMENTS	60—89
--------------------------	-----	-----	-------

Iron and Steel, Copper, Tin, Lead, Bell-metal, Gold and Silver, Horn, Bone and Ivory ; Wood, Stone. Execution. Ornamentation. Edges of sharp instruments. The tempering of sharp instruments. Good and bad qualities of surgical instruments. The uses of instruments.

Whetstone. Instrument cases. Boxes for ointments, ointment pots, and portable cases.
Kapāṭa-Śayana or Fracture-Bed.

CHAPTER IV.

THE NUMBER OF SURGICAL INSTRUMENTS	...	90—99
------------------------------------	-----	-------

Instruments and their classification ; The Yantra or blunt instruments ; The Svastika or cruciform instruments ; The Sandainśa or pincher-like instruments ; The Tāla or picklock-like instruments ; The Nāḍī or tubular instruments, the śalākā or rod-shaped instruments. The Upayanta or accessory instruments. The Śastras or sharp instruments. The Anuśastras or substitutes for sharp instruments.

CHAPTER V.

DESCRIPTION OF THE BLUNT INSTRUMENTS	...	100—224
--------------------------------------	-----	---------

1. The Svastika yantra or cruciform Instruments : Siñhamukha svastika or Lion-faced forceps. Vyāghramukha or Tiger forceps. Vṛkamukha or Wolf forceps. Tarakṣumukha or Hyena forceps. Rkṣamukha or Bear forceps. Dwipimukha or Panther forceps. Mārjāramukha or Cat forceps. Śṛgālamukha or Jackal forceps. Airbbāruka or Deer forceps. Kākamukha or Crow forceps. Kaṅkamukha or Heron forceps. Kuraramukha or Osprey forceps. Cāsamukha or Blue-Jay forceps. Bhāsamukha or Eagle forceps. Śaśaghātīmukha or Hawk forceps. Ulukamukha or owl forceps. Cillimukha or Kite forceps. Syenamukha or Vulture forceps. Grdhrāmukha or Falcon forceps.

Krauñcamukha or Curlew forceps. Bhṛṅgarājamukha or Buteher-bird forceps. Añjalikarṇa forceps. Avabhañjanamukha forceps. Nandimukha forceps. II. The Sandanī or Pincher-like forceps: Forceps with and without handles. Forceps with Smooth and rough ends. Epilation forceps. Mueutī or Mueundī. Vamśabidala or Bamboo forceps. III. Tāla-Yantra or Picklock-like instrument: Ectāla and Dvitāla. The Ear-scoop. IV. The Naḍī-Yantra or Tubular instruments: Kanṭhaśalyāvalokinī or Throat speeulum. Pañcamuka and Trimukha. Tubular instruments for inspection of arrows. Śalyanirghātanī. The Impellant. Tubular instruments for Piles—for inspection and medication. Śamī. The Rectal Speeulum. Calopter. Tubular instruments for the Fistula-in-ano. Tubular instruments for the nose: Nasal Speculum. Nathu-karamī and Yamaka-nathu-karamī. Nasal tubes. The Aṅguli-trāṇaka or Finger-guard. Yoni-Vraṇekṣana or Vaginal Speculum. Diopter. Bivalve Speeulum. The tubular instruments for wounds—Vraṇa-vasti or Wound-Syringe. Tubular instrument for ascites. Dākodara yantra or Canula. Tubular instruments for Hydrocele. Tubular instruments for rectal stricture. Tubular instruments for injection into the rectum—Vasti Yantra or Rectal elyster. Uttaravasti or urethral, vaginal and uterine tubes. Catheters. Tubular instruments for inhalation and fumigation. Disinfection of rooms, clothes &c. Tubular instruments for cupping. Śrīga or horn. Alābu Yantra or gourd. Ghati Yantra. V. Śalakā

or rods : Earthworm probes. Arrow probe. Snake's hood probe. Fish-hook probes. The Śaikus ; Swab probe. Spathomele or spatula probe. Spoon-shaped probes. Cyathiscomele. Nail-shaped probes. Jāmvavauṣṭha probe. Gamma-shaped probe and the aṅkuśa cautery. Collyrium probes. Karpa Śodhana or Ear-cleaner. Garbha-Śaiku or Fœtus or Traction hook. Yujña-Śaiku or Midwifery forceps. Sarpa-faṇa or snake's hood-like rods. Stone extractor. Hippocratic oath. Sarapuṇkha-mukha Probe. Arddhaeandramukha or Half-moon Probe. Bone Lever. Director. Urethral Probe. VI. The Upayantra or Accessory Instruments. Rajju or thread, Venikā or twine ; Paṭṭa or Bandages, Abdominal binder, Field Hospital, Dressings. Carma or leather : leather bandage, leathar ligatures. Yantra-Śaṭaka or Lithotomy Strap or binding apparatus, Pāśa. Leather bags. Śirovasti or leather-bag for the head. Leather Band. Leather Bottles, Jars, etc. Antarvalkala or Barks. The crutches, Tendrils of creepers or Latā. Vastra or cloth. Aṣṭhilāṣma or stone. Mudgara or Hammer. Pāṇipadatala or hand and foot. Aṅguli or fingers. Jihvā or tongue. Danta or tooth. Nakha or nails. Mukha or mouth. Vāla or hair. Probang. Suture material. Aśvakatāka or the ring of a horse's bridle. Śākhā or branch of a tree. Sṭhīvana or spittle. Pravāhana or fluxing the patient. Har a or Happiness. Ayaskānta or Load-stone. Kṣāra or Caustics or Potential cautery. Agni or Actual cautery. Bheṣaja or medicines. Goats' gut ; Arrest of haemorrhage.

CHAPTER VI.

THE ŚASTRA OR THE SHARP INSTRUMENTS ... 225—281

The Mandalāgra or round-headed knife. Karapatra or saw. Vṛddhipatra—dīrghavaktra and hrasvavaktra—the long and short-mouthed knives. Hypodermic medication. Nakhaśastra or Nail-parer. Mudrikā, angulisaśtra or finger or ring-knife. Utpalapatra, Phlebotome. Arddhadhāra, Cakradhāra, adhyardhadhāra. Sueī or needles—curved, half curved and straight. Javamukhī needle. Kuśapatra. Āṭīmukha. Śararīmukha or seissors. Antarmukha: arddhaeandrānana or half-moon-faeed scissors. Ardhaean-dra knife. Trikūrecaka, kūrcea, khaja. Kuṭhārikā. Vrīhimukha or troear. Ārā or awl, Karna-vedhanī or ear-perforater, Juthikā, Pāni-mantha. Karmāra or nālī. Vetaspatraka. Vadiśa or sharp hook, Danta-Śaiķu or tooth-sealer. Danta-lekhana or tooth-sealer. Enī-pada. Eṣanī or sharp probes; needle-shaped probes, Kuruvaka probes. The operation of couching of cataract. Yavamukhī Śalā. Sarpaśya. Gold or silver knife. Pratuda. The mode of holding the sharp instruments. The practical training in surgical operations.

CHAPTER VII.

THE ANUŚASTRA OR ACCESSORY SHARP INSTRUMENTS... 282—294

Bamboo. Dissection. Crystal, Glass and ruby. Leeches. Fire and caustics. Fingers and nails. Leaves. Young stems of plants.

CHAPTER VIII.

HYGIENIC APPLIANCES AND HOSPITAL REQUISITES ...	295—328
---	---------

Tooth-brush. Tooth-pick. Razor and Shears. The
practise of shaving. Keśa-prasādhanī or eomb.
Looking-glass. Dress. Uṣṇīṣa or head-dress.
Chātra or Umbrellas. Yaṣṭhi or stieks. Upānaha
or shoes. Vyājanī and cāmara or the fan. Filters.
Water vessel. Bathing. Drinking Vessels.
Dinner service. Spoons. Spittoons. Bedpans and
Urinals. Pus Basins. Pestle and mortar. Sieves,
Strainers and filters. Cold and hot applications.
Balanee or Māṇadanda. Collyrium pots.
Medicine glass. Dropper. Grind-stone. Stone and
iron muller.

CHAPTER IX.

THE CONCLUSION	329—362
----------------------------	---------

Claim of Indian Medicine as a historical study.
The knowledge of the Science in ancient India.
Antiquarian value of the study. A comparative
study. Relation of the Hindū and Greek
Medical Scienee. Indebtedness of the Persians,
Arabs, Chinese, Tibetans and the modern Euro-
peans.

Appendix	365—366
List of works eonsnltd	367—371
Index—English	374—416
Sanskrit	417—444

CORRIGENDA.

<i>Page</i>	<i>ii</i>	<i>F. N. 3</i>	
„	xi	Para 5	
„	xi	...	<i>F. N. 1</i>
„	xiii	...	„ 1
„	82	line 4	„ 1
„	116	„ 23	„ 5
„	182	„ 10, 15	„ 2
„	x	„ 10	...
„	202	„ 1 of para. 5	...
„	203	„ 2 & last line	...
„	262	„ 12	...
„	308	...	„ 1
„	317	„ 10	...
„	319	...	„ 3
„	320	„ 5	„ 1
„	xiii	...	„ 2
„	xv	...	„ Vijoya
„	3	...	Bibliotheca
„	303	...	„ Maedenell
„	4	...	„ Dārila
„	17	... 7	„ Bhānumati
„	27	item 8	„ Rabi
„	30	...	„ Archæo
„	12	...	„ Sāringadhara
„	31	...	„ Skilful
„	35	... 13	„ Sesame
„	40	„ 8	„ Bhūrjja
„	37	„ 11	„ Water and
„	39	„ 23	Mortar
„	40	„ 14	„ Vṛddha
„	70	”	„ Vṛddhiya.
„	71	...	„ 1 & 3
„	87	... 2 & 4	„ Kapāṭa
„	88	„ 13	„ Pālakāpya
„	99	„ 8	„ Śalya
„	109	„ 8	„ bamboo
„	117	„ 5	„ Barnes'
„	119	„ 19	„ Sorts
„	120	„ 21	„ Shorts.

read Mahāvagga for Mohāvāgga.

„ diagnosis „ diagonosis.

<i>Page</i>	<i>line</i>	<i>read</i>	<i>Jāmvovaustha</i>	<i>for Jamvovoustha.</i>
159	13	...	Cīna	,, China.
178	item 10	...	Obstetric	,, Obstetire.
181	...	" 2	Gayadāsa	,, Gayadāssa.
196	line 12	...	Sesamum	,, Seasum.
219	,, 14	...	effectual	,, effectual.
219	,, 21	...	Pācana	,, Pāchana.
221	item 3	...	Parietes	,, Parietis.
242	line 2	...	Round...four cornered	,, four cornered... .....round.
262	,, 10	...	Hippo	,, Hyppo.
285	,, 15	...	Requisites	,, Requisities.
295	,, 3	...	Yaṣṭhi	,, Yaṣṭi.
306	,, 11	...	octagonal	,, octogonal.
311	item 2	...	hātā	,, hata.
328	,, 3	...	Jolly	,, Jolley.
331	line 18	...	Physician	,, Physian.
340	,, 5	...	amber	,, ambar.
346	,, 18	...	Paitamaha	,, Paitāmoha.
348	,, 2	...	Firoz	,, Firroz.
352	,, 22	...	Areca	,, Arecha.
354	,, 11	...	Dvārusita	,, Davrusita.
355	,, 12	...		

WORKS BY THE AUTHOR.

1. Muscles of the Human Body, arranged in Tabular forms.
Fourth Edition. Re. 1

2. Tropical Abscess of the Liver.

Thesis approved for the degree of Doctorate in Medicine,
Madras University. Rs. 5

3. Glossary of Indigenous Medicinal Plants.

(In the Press)

4. Notices, Biographical and Bibliographical, of the Indian
Physicians and their Works on Medicine.

(In the Press)

5. Medicine in the Vedic times.

(In preparation)

THE STAR MEDICAL HALL,
80, Russa Road North, Bhawanipur,
CALCUTTA.

THE

Surgical Instruments of the Hindus.



CHAPTER I.

INTRODUCTION.

ANCIENT MEDICAL AUTHORS AND THEIR WORKS.

The Science and Art of Medicine, like many other different branches of learning originated with the Hindus. They consider the art of healing as an Upaveda and it is generally known as Āyurveda, that is the art of prolonging life. Like the Vedas, they trace the origin of the science to God, the fountain of all true knowledge. Bramhā transmitted this heaven-born science to this world for benefit of the mortals in one of the sacred writings, the Āyurveda.

It was composed as a sub-division of the Atharva Veda and consisted originally of a *lakh slokas* or a hundred thousand stanzas, divided into a thousand chapters. Then considering the short span of life and inadequate intelligence of man, he divided the book into eight parts¹ as follows:—

¹ तद्यथा ॥ शत्यं शालाक्यं कायचिकित्सा भूतविद्या कौमारभृत्यमगदतत्त्वम् रसायनतत्त्वं वाजीकरणतत्त्वमिति ॥

Suśruta Samhitā, I. i.

कायचिकित्सा शालाक्यं शत्यहर्तृकं विषगरवैरोधिकप्रश्नमनं भूतविद्या कौमारभृत्यकं रसायनानि वाजीकरणमिति ।

Caraka Samhitā, I. xxx.

वेदो ह्यार्थं च एः स्वत्ययनवलिसङ्गलहीमनियमप्रायश्चित्तोपवासमन्तादिपरिग्रहात् चिकित्सां प्राह ।

Ibid.

1. Śalya Tantra or Major Surgery.
2. Śālākya Tantra or Surgery of parts above the Clavicles.
3. Kāya Cikitsā or Inner Medicine.
4. Bhūtvidyā or Demnology.
5. Kaumārabhṛtya or the Science of Paediatrics.
6. Agada or Toxicology.
7. Rasāyana or Treatment to prolong life.
8. Vājīkaraṇa or Treatment to stimulate the sexual power.

The book is no more available now, Suśruta being the authority for the above information.¹

A different view is held by others, who trace the origin of Hindu Medicine in the verses of the R̄gveda.²

¹ इह खल्यायुर्वेदी नाम यदुपाङ्गमयर्घवेदसग्रात्पत्यादैरव प्रजाः शोकशतसहस्रमध्यायसहस्रं ऋतवान् स्वयम्भूः। ततीऽत्यायुष्मत्यमेधस्त्राचावलीका नराणां भूयोऽष्टधा प्रणीतवान् ॥

Suśruta Saṁhitā, I. i.

तत्र चेत् प्रष्टारः सुः चतुर्णास्तकसामयजुरथर्घवेदानां कं वेदमुपदिशत्यायुर्वेदविदः । किमायुः कस्मादायुर्वेदः किञ्चायमायुर्वेदः शाश्वतीऽशाश्वत इति । कानि चासाङ्गानि कश्यायमध्रेत अः किमर्थच्छेति ॥

तत्र भिषजा पृष्ठेनैवं चतुर्णास्तकसामयजुरथर्घवेदानाम् आत्मनीऽथर्घवेदे भक्तिरादेश्या ।

Caraka Saṁhitā, I. xxx.

The origin of medical science, as quoted in the above passage of Caraka, does not however agree with the view expressed by the author in the Sūtra Sthāna, Ch. I. (See footnote 1. P. 4). In Ch. XXX, we find that an attempt had been made to make a compromise between the two views of Agniveśa and Suśruta. Evidently this was the work of a later redactor, possibly Dr̄ḍhavala.

न ज्ञायुर्वेदसग्राम्बूत्तिरूपलभ्यते । अन्यत्रावबीधीपदेशाभ्यासेतदै हयमधिकृत्य उत्पत्तिमुपदिश्येके सामाविकज्ञासर लक्षणमधिकृत्य यदुक्तम् इह चाद्येचाद्याये * * * ॥

Caraka Saṁhitā, I. xxx.

² कर्घवेदसग्रायुर्वेद उपवेदः ।

Carana Vyāha by Vyāsa.

ATHARVA VEDA.

"On examining the contents of the Atharva Veda more in detail, we find that the hostile charms it contains are directed largely against various diseases or the demons which are supposed to cause them. There are spells to cure fever (*takmān*), leprosy, jaundice, dropsy, scrofula, cough, ophthalmia, baldness, lack of vital power, fractures and wounds; the bite of snakes or injurious insects, and poison in general; mania and other ailments. These charms are accompanied by the employment of appropriate herbs. Hence the Atharva Veda is the oldest literary monument of Indian Medicine."¹ This Veda can not belong to a period later than 1000 B. C., but possibly earlier.² It exists in the recensions of two different schools. That of the Paippalāda is only known in manuscript, discovered by Prof. Buhler in Kashmir and described by Prof. Roth in his tract *Der Atharva Veda in Kaschmir* (1875). The printed text, edited by Roth and Whitney in Berlin 1856, gives the recension of the Śaunaka School.³ It has been translated into English Prose by Whitney, 2 Vols.; into English verse by Griffith, 2 Vols., Benares, 1897, and with the omission of the unimportant

¹ Medonnel's Sanskrit Literature, P. 196.

अथर्ववेदस्य * * * * चतुर्थं वेदवैपि प्रायेणाभिचारदर्थत्वाद्यज्ञविद्यायामनुप-
योगाच्चानिर्देशः। तथाहि कृष्णदेवनैव हौत्रं कुर्बन् यजुर्वेदाध्वर्यवं सामवैदेनौज्ञात्रं
यदेव चैव विद्याय सूक्तन्तेन ब्रह्मत्वमितिश्रुते स्त्रीसम्यायत्वं यज्ञानां ज्ञायते।

Kallūka Bhaṭṭa's Commentary on *Manu Smṛitī*, Ch. III, Sloka I.

² On the date of Atharva Veda, see pp. CXL—CLXI, Prof. Lanman's Edition of Whitney's Transl.; Prof. Medonnel's Sanskrit Literature, pp. 185—201.

³ Index Verorum in the Journal of the Am. Or. Soc. Vol. XII.

hymns, by Bloomfield¹ into English Prose, with notes, in Vol. XLIII of the Sacred Books of the East.

CARAKA SAMHITA.

In the Caraka Samhitā we find that Brahmā taught Dakṣa the science of medicine; Dakṣa became the preceptor of the Aśvin twins; they in their turn became the teachers of Indra and Indra imparted this knowledge to Bharadvāja who was sent by a conclave of sages to learn the art for the welfare of the human race.² Bharadvāja had Punarvasu Ātreya and the others as disciples. Ātreya's students were Agniveśa, Bhela, Jatukarna, Parāśara, Hārīta and Kṣārapāṇi, all of whom became celebrated as the authors of treatises on Medicine; the Caraka Samhitā being a revised and improved edition of the treatise of Agniveśa, which was declared to be the best production.³ Caraka did not, however, redact the whole

¹ He has also edited the Kauśika Sūtra of the Atharva Veda, with extracts from the commentaries of Dārita and Keśava (see Vol. XIV Journ. Am. Orient. Soc.). It is very useful as a help to the proper understanding of the meaning of a hymn.

² दीर्घजीवितमस्तिक्ष्णन् भरदाज उपागमत् ।
इन्द्रसुग्रतपा बुद्धा श्ररण्यमस्तेरश्वरम् ॥
ब्रह्मणा हि यथा प्रोक्तमायुर्बेदं प्रजापतिः ।
जयाह निखिलेनादावधिवनो तु पुनस्तः ॥
अश्विभ्यां भगवान् शकः प्रतिपेदे ह कैवलम् ।
ऋषिप्रोक्ती भरदाजस्तस्माच्छकमुपागमत् ॥

Caraka Samhitā, I. i.

³ अथ मैत्रीपरः पुण्यमायुर्बेदं पुनर्बसुः ।
शिष्येभ्यो दत्तवान् घडभ्यः सर्वभूतानुकम्पया ॥
अग्निविशश्च भूलय जतुकर्णः पराश्चरः ।
हारीतः क्षारपाणिश जग्नहस्तमनेवचः ॥
बुद्धिविश्वरूपस्त्रिविश्वरूपदेशालरं सुनेः ।
तन्त्रस्थ कर्त्ता प्रथमसम्यिवेशी यतोऽभवत् ॥
अथ भूलादयथकु स्वं स्वं तन्त्रं क्लतानि च ।
आवयामासुरानियं सर्विसङ्गं सुमेधसः ॥

Ibid, I. i.

book;—the last forty-four chapters¹ were edited by Dr̄dhabala,² a native of Panchanadapura, long supposed to refer to Punjab (the land of five rivers) but at present identified with a town in Kashmir by Dr. Hoernle.³ Two other works, the treatises of Bhela and Hārīta, are still extant; the former existing in manuscript in the Tanjore Library⁴ and the latter as printed texts by *Kavirājēs* K. C. Sen and B. L. Sen, of Calcutta.⁵

Now as regards the age of Caraka, there is great divergence of opinions. The Indians generally believe him to be a R̄ṣi of great antiquity while the European scholars try

¹ For a discussion on the part added by Dr̄dhabala, see Hoernle's Studies in Ancient Indian Medicine, J. R. A. S. 1908, P. 997-1002. Also see pp. 11-15 in the *Vanausadhi Darpaṇa*, Vol. I., by *Kavirāja Birajā Charan Gupta*, 1908.

² अतस्त्वीचममिदं चरकेणातिवुद्दिना ।

संस्कृतं तत् तु संस्कृतं विभागेनीपलन्त्यते ॥

इदमन्यूनशब्दार्थं तत्र दीघविवर्जितं ।

अखण्डार्थं दृढवली जातः पञ्चनदे पूरे ॥

क्लवा वहभ्यस्तत्त्वेभ्यो विशेषाच्च वलीच्चयम् ।

सप्तदशोषधाच्चायसिद्धिकल्पैरपूरयत् ॥

Caraka Saṁhitā, VIII, xii.

अमिन् सप्तदशाच्चायाः कल्पाः सिङ्गय एव च ।

नासाद्यन्तेऽग्निवेशस्य तत्त्वे चरकसंस्कृते ॥

तानेतान् कापिलवलः श्रीषान् दृढवलीऽकरीत् ।

तत्त्वस्यास्य महार्थस्य पूरणार्थं यथातयम् ॥

Ibid, VI, xxx.

³ Hoernle's Studies in the Medicine of Ancient India, Part I, Osteology, Introduction, p. 2. See also his article on "The authorship of Caraka Saṁhitā" in the *Archiv für die Geschichte der Medizin*, 1907.

⁴ See Burnell's Tanjore Catalogue No. 10773 of Sanskrit MSS., P. 63.

⁵ It is doubtful whether the Hārīta Saṁhitā is the genuine work of the R̄ṣi, Hārīta. The printed text refers to Caraka, Suśruta and even Vāgbhaṭa, who were decidedly posterior to Hārīta. See the Footnote 3, P. 6.

to connect him with historical events of more modern times. Sylvain Lévi has recently discovered in the Chinese Translation of the Buddhist *Tripitaka* that Caraka was the Court Physician of the Indo-Seythian King Kaniṣka, in the first century A.D.¹ But the following objections are to be met with before his conclusions can be accepted as proved :—

1. The age of Kaniṣka is not yet settled, the probable limits of his reign being from the first century B. C. to the second century A. D.² Moreover in the Buddhist *Tripitaka* referred to, the name of Caraka is simply mentioned as the Court Physician of the King Kaniṣka but there is nothing to identify him with the author of the book. The same name, found in different places, does by no means signify the same person.

2. The time assigned to Caraka by the Indian medical tradition is of great antiquity. With regard to the chronological position of the three old authors, he is mentioned as anterior to Suśruta and Vāgbhaṭa I.³

3. Dr. Rāy has pointed out that the name Caraka is patronymic in the Veda.⁴ It is quite possible that a much

¹ See Journal Asiatique—July to December 1896, p. 444 to 484 and January to June 1897, p. 5 to 42; also Indian Antiquary Vol. XXXII, 1903, p. 382 and Vienna Oriental Journal, Vol. XI., p. 164.

² See V. A. Smith's Early History of India, P. 225-26.

Dr. Fleet in J. R. A. S., 1906, P. 979.

Dr. Bhandarkar in J. R. A. S. (Bombay Branch), Vol. XX, P. 269.

J. A. S. B. Vol. XXXIX, 1870, p. 65 and 126.

³ चरकः सुश्रुतश्च वाग्भटश्च तथापरः ।
मुख्याश्च संहिता वाचास्तिस एव युगे युगे ॥
अचिः कृतयुगे वैद्यो द्वापरे सुश्रुतो मतः ।
कलौ वाग्भटनामा च गरिमाच्च प्रदृश्यने ।

Hārīta Saṁhitā, Parīśiṣṭādhāya.

⁴ Dr. P. C. Rāy's History of Hindu Chemistry, Introduction, P. X.

later namesake of his, is referred to by the *Tripitaka*, just as we know that more than one Vāgbhāṭa appeared as successful physician. Again we have evidence that eminent physicians in later times were called Caraka by way of a compliment and so Vāgbhāṭa was called Caraka of Sindh or Sindhicara.

4. Pāṇini wrote special Sūtras for the Agniveśas and the Carakas.¹ These names must have been famous before Pāṇini's time, otherwise he would not have written special Sūtras for them. Prof. Goldstucker has conclusively proved that Pāṇini could not have flourished later than the sixth century B. C.²

5. Patañjali wrote a commentary on Caraka.³ He flourished during the second century B. C. Both Cakrapāṇi-datta and Bhoja allude to him as the redactor of Caraka Saṃhitā.⁴ So Caraka must have flourished long before him, for unless his work was regarded as a standard work of authority, Patañjali would not have taken so much pains to write notes on the book, and still more for issuing a redaction.

6. The internal evidence of the book itself speaks against such an assumption. There is no salutation to any deity at the

¹ कठचरकालूक । Pāṇini 4. 3. 107.

गर्गदिव्यी यत्र ॥ Ibid, 4. 1. 105.

गर्ग । वत्स । * * * * अधिनेश् * * * * पराश्र । जतुकर्ण । * * * .

² Goldstueker's Pāṇini; and Journal of the Asiatic Society of Bengal, Vol. XLII, P. 254.

³ आसीनाम अनुभवेन वत्सत्वस्य कात्स्नेन निश्चयवान्, रागादिवशादपि नान्यथावादीयः स इति चरके पतञ्जलिः ।

Quoted in Laghumañjuṣā of Nāgeśa Bhaṭṭa (Rāy).

⁴ पातञ्जल—महाभाष्य—चरकप्रतिसंस्कृतैः ।

मनोवाक्-कायदीषाणाम् हर्त्तैःहिपतयै नमः ॥

Vidle salutation in the Āyurvedārthadīpikā.

beginning of the book,—a custom invariably found to be observed in the more modern compilations. There is complete absence of Paurānic theology in the Caraka Saṁhitā, nor is there any reference to Śākyā Muni and his religion. Kaniṣka was a great patron of Buddhism, and it might naturally be expected from the Court Physician of the king to describe the charitable hospitals which we know from the edict of Aśoka, to have flourished in every quarter of India. On the contrary we find descriptions of a hospital as reserved for rich men only at their own houses. Those gods and goddesses that figure so prominently in the Purāṇas were unknown during his time.¹ Beef was not then, apparently, a

¹ No doubt the names of Lākṣmī, Kṛṣṇa and Vāsudeva occur in Cikitsita Sthānam, Chapter XXV, but it should be remembered that they occur in the Supplement added by Dṛḍhavala in later times.

सर्वथा न तव प्रभवति न चाग्निश्वसनृपचौगः ।
लद्मीश तव भजते यत्र महागन्धहस्यम् ॥
पितृमाण इमञ्चाव सिद्धं मन्त्रमूदीरयेत् ।
मम माता जया नाम विजयी नाम मे पिता ॥
सोऽहं जयी जयापुत्री विजयीऽय जयामि च ।
नमः पुरुषसिंहाय विष्णवे विश्वकर्मणे ॥
सनातनाय कृष्णाय भवाय विभवाय च ।
तेजी हषाकपे: साक्षात् तेजी ब्रह्मेन्द्रीयम् ॥
यथाहं नाभिजानामि वासुदेवपराजयम् ।

Caraka Saṁhitā, VI, xxv.

But Kṛṣṇa and Vāsudeva are mentioned in Pāṇini as demigods, having many adherents who formed a class. “वासुदेवार्जनाभ्यां वुन्” Pāṇini, 4. 3. 98. Again the passage may be an interpolation of a subsequent *Vaiṣṇava Vaid*.

So Br̥ahvadhvaja is also mentioned in Dṛḍhavala's Supplement, as a god to be worshipped during the preparation of some medicines :

ब्रह्मघीषशङ्खपटहमेरीनिनादेः सिद्धं सितच्छतक्षतच्छायं गजस्त्रिमारीपयेन्नगवनं
वृषभजमभिपूज्य तं स्त्रेहं विभागमाचिकमङ्गलाभ्याः स्तुतिदेवता च नैवेति ॥

Ibid, VIII, xii.

forbidden food, for it is spoken of as an article of diet that should not be indulged daily,¹ nor should it be used in excessive quantity as it is mentioned as a cause of the disease, Vāta-Rakta.²

The style of the book is antiquated and decidedly savours that of the Brāhmaṇas. Nāya and Vaiśeṣiki systems occur in the text,³ and so probably the book was written long before the compilation of these Sūtras.

Editions.—The book had undergone several editions. It was edited by Jibānanda Vidyāsāgar, Calcutta, in 1877 and 1896 (2nd Ed.) ; by Gaṅgādhar Kaviratna, Berhampur, 1879 ; by Gupta, Calcutta, 1897 ; with commentary by Cakrapāṇidatta, Calcutta, 1892-93 ; by Jaśodānandana Sarkār, with Bengali translation, 1894.

Translations.—It had been translated into English by A. C. Kaviratna, Calcutta, 1897. Caraka was translated from Sanskrit

And we find that the antidote to poisen called महागन्धहस्ती is said to have been told by Tryambaka (Śiva) to Baīśravaṇa (Kuvera):

अगदीऽयं वै यवणाख्यातन्त्यस्वकेण पट्टङ्गः ।

Caraka Samhitā, VI. xxv.

Also we find the name of Kārttikeya mentioned in Sec. IV. ch. viii.

प्रसुव त्वमविक्षिष्टमविक्षिष्टा शुभानने,

कार्त्तिकेयव्युति पुत्रं कार्त्तिकेयाभिरच्छितमिति ॥

¹ कुर्चिकांश किलाटांश शौकरं गव्यमासिषं ।

सत्सान् दधि च माषांश यादकांश न शौल्येत् ॥

Ibid, I. v.

² कुलत्यमाषनिष्पावशाकादिपलत्तुभिः ।

दध्यारनालसौवीरयुक्तक्षुरासवैः ॥

Ibid, VI. xxix.

³ Vide Caraka, III. viii.

into Arabic in the beginning of the eighth century and his name "Sharaka Indianus" occurs in the Latin translations of Avicenna, Rhazes and Serapion. "A translation of the Karaka¹ from Sanskrit into Persian and from Persian into Arabic is mentioned in the Fihrist, (Finished 987 A.D.). It is likewise mentioned by Albérūnī²; the translation is said to have been made for the Barmekides."³ Albérūnī's chief source on Medicine was "Caraka, in the Arabic Edition of Ali Ibn Zain, from Trabaristan."⁴

Commentaries.—

1. Patañjali—2nd century B.C.—not available.
2. Cakrapāṇidatta's Caraka Tātparya Tīkā, or Āyurvedadīpikā⁵—1060 A.D.
3. Haricandra⁶—1111 A.D.—not available.
4. Śibadāsa's Caraka-Tattva-Pradipikā.
5. Gaṅgādhar's Jalpa-Kalpa-Taru—1879 A.D.

¹ Proceedings of the As. Soc., Bengal, 1870, September.

² Reinaud, *Mémoire sur l'Inde*, P. 316.

³ Maxmuller's Science of Language, Vol. I., P. 168, Foot Note.

⁴ Sachau's preface to India, P. XL.

⁵ See Caraka Saṁhitā with Cakrapāṇidatta's Commentary by Karirāja Harināth Viśārada, Calcutta, 1895.

⁶ A Commentary written by Haricandra is referred to in the Sanskrit Slokas narrating the geneology of Maheśvara, the author of Viśvaprakāśa and Sāhasāṅkacarita, who flourished during the reign of Sāhasāṅka, king of Gazipur in 1033 Saka (1111 A. D. Wilson).

श्रीसाहसाङ्गृपतेरणवद्यविद्य-
वैद्योन्नरङ्ग पदपञ्चतिमेव विभृत् ।
यशन्द्रचारुचरितो हरिचन्द्रनामा
सङ्गाल्यया चरकतत्त्वमलंचकार ॥

SUŚRUTA SAMĀHITĀ.

The next treatise on Hindu Medicine is the Suśruta Samāhitā. Suśruta was the son of the sage Viśvāmitra,¹ a contemporary of Rāma. He learned the Science of Medicine from Divodāsa, surnamed Dhanvantari, king of Benares, at his Himalayan retreat. According to Suśruta, Divodāsa was the incarnation of Dhanvantari, the celebrated physician of the gods in heaven, and he first propounded the Art of Healing in this world.² Suśruta represented the Surgical School while Caraka was pre-eminently a Physician in practice.

As regards the authorship of the book, opinions differ. To Suśruta, Dhanvantari addressed his lectures on Major Surgery,³

¹ Mahābhārata, Anuśāsana Parva, Ch. 139, Vs. 8-11.

धन्वन्तरिर्धर्मभृतां वरिष्ठो वाग्निशारदः ।

विश्वामित्रात्मजसुविं शिवं सुशुतमण्डशात् ॥

Suśruta Samāhitā, V. ii.

अष्टाङ्गयर्वेदविदं दिवीदासं महामतिं ।

क्षिण्डशास्त्रार्थसन्देहं सूच्चमागाधमिवोदधिं ।

विश्वामित्रसुतः श्रीमान् सुशुतः परिपृच्छति ।

Ibid, VI. lxvi.

सर्वशास्त्रार्थतत्त्वज्ञ सपीद्विष्टि रुदारधीः ।

वैश्वामित्रं शशासाथ शिवं काश्चिपतिर्मुनिः ॥

Ibid, VI. xxviii.

² अयं खलु भगवन्तममरवरमृषिगणपरिवृत्तमाश्रमस्यां काश्चिराजं दिवीदासं धन्वन्तरिमोपध्यनवैतरण्योरभपोक्तालावतकरवौर्यगोपुररचित्तमुशुतप्रभृतय ऊचुः ।

Ibid, I. i.

³ अत्र कमै किमुच्यतामिति । त ऊचुः । अम्माकं सर्वेषामेव शल्वज्ञानमूलं क्वत्वीपदिश्तु भगवान्ति । स उवाचैवमल्लिति । अम्माकमेकमतीनां भतमभिसमीक्ष्य मुशुतो भगवन्तं प्रव्यति ।

Ibid, I. i.

which he reproduced in this work. But in the opening lines of the book, salutation is offered to Brahmā, Dakṣa, Aśvins, Indra, Dhanvantari, Suśruta and others.¹ This shows that Suśruta can not be the author of the work or at least of the work in its present shape, for no author can offer salutation to himself. By "the others" are no doubt meant the notable surgeons who practised and taught the Science of Surgery and who were either contemporary with or posterior to Suśruta. Possibly the original Suśruta Saṃhitā had been recast and the redactor could appropriately offer a salutation to the original author and to other surgeons who flourished before him. There is also an Indian medical tradition, noted in Dallanācārya's Commentary, which assigns the improved and supplemented edition of Suśruta's original work to Nāgārjjūna,² the celebrated Buddhist Chemist, who is said to have been a contemporary of the king Sātvāhana.³

In the third chapter, Suśruta enumerates the subjects described by him,—the chapter forming an index of the book. Therein he mentions the five principal divisions of his book and says that the Uttara Tantra or the Supplement would be

¹ नमो ब्रह्मप्रजापत्येषिवलभिङ्गन्तरिसुशृतप्रस्तिभ्यः ।

Suśruta Saṃhitā, I.

² यत यत परीक्षे निधीगस्तव तदैव प्रतिसंस्कृत्सूत्रं ज्ञातव्यमिति । प्रतिसंस्कृतार्थापौह नागार्जुन एव ।

Dallanā's Commentary to Suśruta, I. i.

See also Dr. Cordier's *Recentes Découvertes*, pp. 12-13.

³ See Harṣacarita by Vāṇa.

Beal's *Buddhist Records of the Western World*, Vol II., P. 209, 212, 216.

Burgess' *Archæological Survey of S. India*.

Introd. à l'*Histoire du Budh.* Ind., P. 508.

described afterwards.¹ Now the fact that the sixth part was appended to the work as a Supplement or Uttara Tantra (*i.e.*, after treatise) clearly shows that it was written afterwards by another surgeon and added to the original treatise. If the original Suśruta wished to have six divisions of his book, he would have mentioned it clearly in the index and would not have, after stating that his book consisted of five parts, added that "the Supplement would be described afterwards,"² which seems to be an interpolation of the Supplementor to pass his edition as the orginal work of the author. Again at the end of the fifth section, there is a passage describing the importance of the Āyurveda, which was meant as the conclusion of the book by the author.³ It is to be noted

¹ प्रागभिहितं सविंश्मध्यायशतं पञ्चमु स्थानेषु । तत्र सूचस्थानमध्यायाः पट्चलारिश्त् । षोडश निदानानि । दश शारीराणि । चत्वारिंश्चकित्सितानि । अटौ कल्पाः । तदुत्तरं पठ्यष्ठिः ।

अध्यायानां शतं विंश्मेवमेतदुदीरितम् ।

अतःपरं स्वनाम्नैव तत्त्वमुक्तरमुच्यते ॥

Suśruta Saṁhitā, I. iii.

² वीजं चिकित्सितैतत् समाप्तेन प्रकीर्तितम् ।

सविंश्मध्यायशतमसा व्याख्या भविष्यति ॥

तत्र सविंश्मध्यायशतं पञ्चमु स्थानेषु । तत्र सूचस्थाननिदानशारीरचिकित्सितकल्पे-
खर्यवशात् सविभज्यात्तरे तत्त्वे शेषानयान् व्याख्यायासप्राप्तः ।

Ibid, I. i.

³ सविंश्मध्यायशतमेतदुक्तं विभागशः ।

इहीद्विदाननिर्दिष्टानसर्वान् वत्याम्यथीक्तरे ॥

सनातनलाङ्किदानामक्तरवात्तथैव च ॥

तथा दृष्टफलत्वाच्च हितत्वादपि देहिनां ।

वाक्समूहार्थविलारात् पूजितत्वाच्च देहिभिः ॥

चिकित्सितात्पुण्यतमं न किञ्चिदपि सुश्रुत ।

ऋषेरिन्द्रप्रभावसामृतयोनेर्भिषगुरीः ॥

धारयित्वा तु विमलं मतम् परमसम्मतं ।

उक्ताहार समाचारद्वृहं प्रेत्य च मीदते ॥

Ibid, V. viii.

that at the end of no other sections do we find a similar passage. He also writes: "Thus one hundred and twenty chapters are described" but adds: "The other diseases shall be described in the *Uttara Tantra*": the latter part no doubt is an interpolation of the Supplementor. Moreover, in the opening lines which serve as a preface to the sixth part, the authority quoted for the diseases of the eye is Nimi, the king Janaka of Mithilā and not Dhanvantari.¹ But in the first chapter of the first section, it is described that the sages wanted Dhanvantari to teach them Śalyatantra or Major Surgery only and he consented to their request. And this subject he treated in detail in the five sections of the book. In the Supplement, on the other hand, are described the other branches of the science such as Minor Surgery, Inner Medicine, &c. Probably this part was added afterwards to give completeness to the treatise; and the original Suśruta was called Vṛddhya or the Old by the commentators to distinguish him from the Supplementor.

Suśruta's work is specially important to us as having two whole chapters (vii and viii of Section I.) devoted to the descriptions of Surgical Instruments and one whole chapter (xxv of Section I.) to the principles of Surgical Operations.

The age of Suśruta is also involved in obscurity. Nothing can be ascertained from the fact that he was a son of Viśvāmitra²,

¹ अथ्यायानां शते विशेषं यदुक्तमसङ्गन्मया ।
वक्ष्यामि वहृधा सत्यगृत्तरेऽर्थानिभानिति ॥
इदानीन्तत् प्रवक्ष्यामि तन्वमुत्तरमुत्तम् ।
निखिलेनीपदिश्यन्ते यत्र रोगाः पृथग्विधाः ॥
शालाक्यशास्त्राभिहिता विदेहाधिपकौर्चिताः ॥

Suśruta Samihitā, VI. i.

² Viśvāmitra is the *gotra* name; so the simple name may either refer to the great Viśvāmitra or to his descendants.

for the age in which the latter lived is not known to us. But he must have flourished during the Vedic Age as many Vedic Hymns are ascribed to him. In the *Mahābhārata*, Suśruta is mentioned as one of the sons of Viśvāmitra¹ and in the *Suśruta Samhitā* the author is often described as his son. The age of the great epic has, with good reasons, been fixed at 1000 B.C. So Suśruta must have flourished much earlier. The latest limit which we can assign to Suśruta is 600 B.C. as "there are indications in the *Śatapatha Brāhmaṇa*, a secondary Vedic work, that the author of it was acquainted with the doctrines of Suśruta" as regards the Osteology. "The exact date of that work is not known, but it is with good reason referred to the sixth century B.C." Again in the *Atharva Veda*, in the tenth book, there is a hymn on the creation of man in which the skeleton is described according to Ātreya and Suśruta.² "The large portion of it (Books I to XVIII) indeed admittedly belongs to a much earlier period, possibly as early as about 1000 B.C.; and the hymn in question is included in this older portion"³. This shows that Suśruta could not have flourished later than 1000 B.C.

Again in *Hasti-Āyurveda*, a book on the Treatment of

¹ श्वामायनोऽय गार्यश्च जावलिसुश्रुतस्तथा—

* * * * *

विश्वामित्रायज्ञाः सर्वे मुनयो ब्रह्मवादिनः ॥

Mahābhārata, *Anuśāsana Parva*, Ch. IV.

² See J. R. A. S., 1906, P. 915; 1907, P. 1.

³ Hoernle's Studies in the Medicine of Ancient India, Part I. Osteology, Introduction, P. 9.

Elephants by Pālakāpya, we find the Surgical instruments described after the manner of Suśruta. Pālakāpya lived as a Veterinary Surgeon in the Court of Romapāda, King of Aṅga, which had as its capital the famous town of Campā, identified with the modern town of Bhāgalpur. King Romapāda was contemporary with king Daśaratha, the father of Rāma, the hero of Rāmāyana.¹ Here we have a corroborative evidence of the age of Suśruta.

Suśruta is mentioned in the *Vārttikas* of Kātyāyana² who flourished during the fourth century B.C.

We have alluded to Nāgārjjūna,³ the Buddhist Chemist, as the redactor of the Suśruta Saṃhitā. He is said to have been a contemporary of king Kaniṣka that is about the first century B.C.

Another revision was undertaken by Candrate, the son of Tisāta, the author of Cikitsā-kalikā. He revised the text which must have fallen then into a state of corruption. The probable date of Candrate is the ninth century A.D.⁴

¹ अग्निं शुश्रूषमाणसा पितरं च यशस्विनम् ।

एतमित्येवकालं तु रोमपाद प्रतापवान् ।

Rāmāyana, Vālakāndam, Ch. IX.

See also Rāmāyana, i, 11, 13-20 ; Mahābhārat, iii, 110, 10008-9 ; Bhāgavat, ix, 23, 7-10.

² सुश्रुतेन प्रीतं सौश्रुतं ।

³ Possibly more than one Nāgārjjūna appeared in ancient India as a chemist. Albérūnī says : "He lived nearly a hundred years before our time" (India, I. P. 189). Rājtarāṅgīnaī places him in the 3rd century B.C. (I. Vs. 172-173). The modern scholars are of opinion that the founder of the Mahāyāna system lived in the first century A.D.

⁴ Hoernle's Osteology, p. 100.

There is no doubt of the tradition that Suśruta's work was redacted, for the author could not write such a passage as follows : "The surgical treatises of Aupadhenava, Aurabhra, Suśruta and Pouṣkalāvata from the basis of other treatises on the subject."¹

*Commentators.*²—

1. Cakrapāṇidatta—Vānumati—1060 A.D.
2. Gayadāsa—{Nyāya Candrikā or Pañjikā }—11th century A.D.
3. Jejjatācāryya.
4. Bhāskara.
5. Mādhava.
6. Bramhadeva.
7. Dallāṇācāryya—Nibandha Saṃgraha—12th century A.D.
8. Ubhalta (Kashmir).

Editions.—Suśruta Saṃhitā has been edited by Madhusūdan Gupta, Calcutta, 1835 ; by J. Vidyāsāgar, 3rd Edition, Calcutta, 1889 ; by A. C. Kaviratna, Calcutta, 1888-95 ; by Prabhurām Jībanarām, Bombay, 1901 ; and by Virasvāmī, Madras.

This book has been translated into English in part only by U. C. Datta 1883, A. Chāṭopādhyāy 1891, Hoernle 1897, Calcutta, in the *Bibliotheca Indica*. It has been translated into Latin by Hessler and into German by Vullurs.

The book was translated into Arabic before the end of the eighth century A.D. It is called "Kitab-Shawshon-al-Hindi"

¹ श्रीपञ्चनवमौरभं सौश्रुतं पोषकलावतम् ।
श्रीषाणां शत्यतत्त्वाणां मूलान्येतानि निर्दिशेत् ॥

Suśruta Saṃhitā, I. iv.

² * * * * श्रीसहनपालदेववृपतिवल्लभः श्रीडल्लणः समभूत् । तेन
श्रीजैज्ञभट्टं टीकाकारं श्रीगयदासभास्करौ च पञ्चिकाकारौ श्रीमाधवत्रवृ-
देवादीन् टीप्पनककारां श्रीप्रज्ञीत्र्यायुर्बेदशास्त्रं सुश्रुतत्र्याख्यानाय निवन्धसंग्रहः क्रियते ।

Dallāṇa's Commentary, I. i.

and also mentioned as "Kitab-i-Susrud" or Book Suśruta by Ibn Abillsaibial. Rhazes often quotes Sarad as an authority in Surgery.¹

VĀGBHATA I.

The next author of celebrity and whose work is still extant is Vāgbhaṭa I or Vāgbhaṭa the elder, the author of Aṣṭāṅga Saṃgraha (*i.e.*, Compilation of the Octopartrite Science). In later times, a namesake of his, wrote another work called Aṣṭāṅga Hṛdaya Saṃhitā (or the best Compendium *i.e.*, the Heart of the Octopartrite Science). In the Uttara Sthāna, Vāgbhaṭa the younger distinctly states that his Compendium is based on the Compilation of Vāgbhaṭa the elder.²

As regards the age of Vāgbhaṭa the elder, there is the same uncertainty as with his predecessors. We are however sure that he is posterior to Caraka and Suśruta for he refers to these writers by name.³

The chronological relation of the three early authors is described in a popular couplet that Ātreya, Suśruta and Vāgbhaṭa were the three great medieval authors for the three Yugas—

¹ "His next description is from an author named Sarad, whom he frequently quotes in other parts of his works".

Adam's Commentary on Paulus Aeginetta, VI. lxi.

² अष्टाङ्गवैद्यकमहीदधिमन्यनेन योऽस्ताङ्गसंयहमहास्तराश्चिरात् ।

तस्मादनत्यफलसत्यसमुद्यमाणां प्रीतर्थमेतदुदितं पृथगेव तत्त्वम् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, Uttara Sthāna, Ch. XL, v. 82.

³ By name, *e.g.* in Saṃgraha, Bombay ed., Vol. I, P. 246; Vol. II, P. 421. Again quoted from Caraka, Ibid., Vol. I, pp. 20, 93; Vol. II, pp. 212, 213, *et passim*; from Suśruta I, *ibid.*, Vol. I, pp. 109, 121, 177, 247; Vol. II, p. 303, *et passim*. (Hoernle).

the Tretā, Dvāpara and Kali, respectively.¹ They are known as the Vṛddha Trayī or the Old Triad. This medical tradition goes much against the conclusion of Dr. Hoernle that Vāgbhāṭa I must have flourished early in the seventh century A.D. One of the reasons put forward by him is the fact, that "the Buddhist pilgrim I'Tsing, who resided ten years in the Nalandā University (in Bihar) from about 675-686 A.D., states in *Records of Buddhist practices* that the eight arts (*i.e.*, the branches of medicine) formerly existed in eight books but lately a man epitomised them and made them on one bundle (or book)."² Professor Jolly understands by it the Suśruta Samhitā while Dr. Hoernle points out with more reasons that it refers to Vāgbhāṭa I's work, the Aṣṭāṅga Saṅgraha (*i.e.*, the Compilation of the Octopartrite Science) and rules out Suśruta by the word "lately."³ But the description that I'Tsing gives of the contents of the book does not warrant any reference to either. Moreover, he has not given any reason why Vāgbhāṭa II's book Aṣṭāṅga Hṛdaya Samhitā (the best Compendium of the Octopartrite Science) might not be alluded to by I'Tsing. Dr. Hoernle, however, rules him out by date for "he can not be placed earlier than the eighth century"—an assertion unsupported by any evidence whatsoever. All that he has proved is that "Accordingly it is probable that all these three medical writers (Mādava, Dr̥ḍhabala and Vāgbhāṭa II) come in the period from the 7th to the

¹ See foot-note 3, P. 6.

² I'Tsing: Records of the Buddhist Religion. Transl. by Professor Takakusu, P. 128.

³ J. R. A. S., 1907, P. 413.

Hoernle's Osteology, Introduction, P. 10—11.

9th century A.D.¹ at no very great interval from one another," and this proof is based on the age of Vāgbhaṭa I as suggested by I'Tsing's remarks. Thus he has taken for granted what he is required to prove. He has shown that Suśruta is anterior to Vāgbhaṭa I; and Vāgbhaṭa II is posterior to him. But in trying to prove that Vāgbhaṭa I lived in the seventh century he cannot assume that Vāgbhaṭa II lived in the eighth. Another evidence adduced in support of his conclusion is the fact that the non-medical version of the list of bones of the human body as contained in the Law-book of Yājñavalkya presupposes earlier uncorrupted forms of lists of bones both in Caraka and Suśruta, and "the corrupt reeension, traditionally handed down, must have come into existence at a later date," that is to say, between the date of Yājñavalkya (350 A.D.) and Vāgbhaṭa I, the latter of whom is proved to have copied from the corrupt recensions of Caraka and Suśruta. Thus the older reeensions still existed in the fourth century A.D. and if we add to it the interval of time necessary for the texts to have fallen into a state of corruption, we get the early seventh century A.D. for Vāgbhaṭa I. But we must remember that there is nothing to prevent against the supposition that Vāgbhaṭa I lived before Yājñavalkya. There might have been two recensions of the texts available during Yājñavalkya's time, one corrupted and it might or might not have been the work of Vāgbhaṭa I and another true version which was availed of by the sage Yājñavalkya. And similar events have happened, as has been pointed out by Dr. Hoernle himself, in our own generation. Gaṅgādhar's reeension of Caraka is a corrupted form of the text,

¹ *Ibid.*, P. 16.

while the recension given in Jībānanda's edition is the traditional text of Caraka. No critic would I think jump into the conclusion that Gaṅgādhar lived three or four centuries after Jībānanda. Again if it be true, as he contends, that Suśruta was redacted by Vāgbhaṭa I, we could easily imagine that Yājñavalkya copied his list bones from the original Suśruta and not from the redaction of Vāgbhaṭa I. So we see that the age assigned to Vāgbhaṭa I, or the seventh century A.D. can not be accepted as proved. Dr. Hoernle says : "It should, however, be understood that these conclusions regarding the date and authorship of Vāgbhaṭa I, are not put forward as established fact."

Let us recapitulate the objections that can be urged against the conclusion that Vāgbhaṭa I lived in the seventh century A.D.

1. Vāgbhaṭa I is believed by the Indian medical men to have flourished long before the Christian era. By some, he is connected with the court of Yudhiṣṭhīra, but his name is nowhere mentioned in the Mahābhārata. Ātreyā, Suśruta and Vāgbhaṭa are described as the Old Triad or Vṛddhya Trayī and they were the authorities for the Tretā, Dvāpara and Kali Yugas, respectively. It is curious to observe that Dr. Hoernle in arguing against the conclusion of Prof. Jolly that Suśruta is meant by ITsing, takes advantage of this Indian medical tradition that Suśruta flourished during pre-historic times, but does not mention the same tradition with regard to Vāgbhaṭa I, which goes against his own conclusion. On the other hand the same objection does not apply against Vāgbhaṭa II.

2. The name of Vāgbhaṭa. I's book, Compendium of the

Octopartrite Science, no doubt, agrees very well with the description of I'Tsing that "lately a man collected them into one bundle." But Vāgbhaṭa II's book "The best Compendium of the Octopartrite Science" is equally suggestive, though Dr. Hoernle says: "it cannot prevail by the side of the more suggestive name of the rival work of Vāgbhaṭa the elder."

3. Again in arguing against Prof. Jolly, Dr. Hoernle has attached much importance to the word "lately" by which Suśruta is ruled out by date. Admitting the validity of such reasoning, it does not follow that by the word "lately" I'Tsing meant any contemporary author or any one who preceded him by a short period only. To comprehend the meaning of the sentence we must understand the word "lately" in connection with the word "formerly" used before.¹ Now the sentence "The science of medicine formerly existed in eight books" no doubt refers to the division of Āyurveda into eight parts by Brahmā and to the treatises on the different branches of Medicine by Agniveśa, Suśruta and others. These treatises are believed to be of remote antiquity, and so any later compilation may be spoken of as recent in comparision with the old treatises of unknown ages. Thus the word "lately" may refer either to Vāgbhaṭa I or Vāgbhaṭa II, but the latter author's claim to the honour becomes reasonable considering his decided posteriority to the former and so coming within the limit of the time suggested by the word "lately."

4. Again I'Tsing refers to a book which was recognised as the standard throughout India. This may refer either to

¹ J. R. A. S. 1907, P. 174.

Vāgbhaṭa I or II. But if Vāgbhaṭa I's book occupied such a position at the time of I'Tsing, it becomes difficult to imagine why Vāgbhaṭa II should write another work principally based on the work of Vāgbhaṭa I after a lapse of a century or so. Moreover, we find at the present time, that Vāgbhaṭa II's book, Aṣṭāṅga Hṛdaya Saṁhitā, has a wider popularity than the book Aṣṭāṅga Saṅgraha of Vāgbhaṭa I. The former has been printed many times and is widely read by the students,—so much so Vāgbhaṭa is generally known as the author of Aṣṭāṅga Hṛdaya Saṁhitā.

5. Moreover, the Arabian physician Rhazes, who is said to have lived in the ninth century (882 A.D.) in treating of the property of ginger, the common plantain or musa and other drugs, quotes from an Indian writer, whom he calls Sindaxar or Sindicara.¹ Royle says: “But in the article De Allio another Indian author is quoted, whom I have not been able yet to trace out—*Ait Sindifar* (in another place written “*Dixit sindichar*”) *indianus valet contra Ventositatem.*” This Sindicara is identified with Vāgbhaṭa II of Sindh who was in his time known as a second Caraka or Cara, the syllable “ka” making no difference, as in words like “bāla” and “bālaka,” both meaning a child.² We know that the Vāgbhaṭa's Aṣṭāṅga Hṛdaya Saṁhitā was one of the medical works translated by the order of Caliphs in the eighth century.³

6. The translations of the Caraka, the Suśruta and the Vāgbhaṭa occur in the Thibetan Tanjur.⁴ “George Huth,⁵

¹ Antiquity of Hindu Medicine, Page 38.

² History of Aryan Medical Science, P. 196.

³ Zeit. deut. morg. Ges. 34, p. 465.

⁴ Jour. Asiatic Soc. XXXVIII. (1835).

⁵ Zeit. deut. morg. Ges. T. (LXIX. pp. 279—284).

who has recently critically examined the contents of the Tanjur, concludes that the most recent date at which it can be placed is the 8th century A.D.”¹

So I cannot avoid the conclusion that of the three authors, Suśruta, Vāgbhaṭa I and II, to which I’Tsing’s remarks may refer, the last has probably the best claims to that reference ; and the date assigned to Vāgbhaṭa I may well suit Vāgbhaṭa II i.e., “as late as the early 7th century A.D.”² and possibly still earlier.³ Again it is impossible for us to say whether I’Tsing’s remarks may not appropriately refer to other authors whose works are lost to us.

Mention should also be made of the fact pointed out by Dr. Cordier that Vāgbhaṭa is mentioned in Rājtarāṅgiṇī and his date is fixed there as 1196-1218 A.D.⁴

But the name of Vāgbhaṭa does not occur in Stein’s edition of Rāj, which is no doubt the most reliable, and so we can easily dismiss this view as untenable.

Editions.—Vāgbhaṭa I’s book Aṣṭāṅga Saṅgraha has been printed in Bombay.

Commentary.—Arunadatta—about 1220 A.D.

¹ P. C. Rāy’s History of Hindu Chemistry, Intro., P. XXIX.

² Hoernle’s Osteology, Intro., p. 10.

³ Dr. Kunte places him “at least as early as the second century before Christ,” Vide his Intro. to Vāgbhaṭa’s Aṣṭāṅga Hṛdaya Saṃhitā.

⁴ सिंहग्रस्तः परमवौद्धो वागभटाचार्थः काश्मीरनगरपति जयसिंहस्य प्रजापालन समये (खृः इदं शताब्द्याम्, शक १११८—४०) वर्तमाना आसीत्।

Quoted in Cordier’s Vāgbhaṭa et L’Aṣṭāṅgahṛdaya Saṃhitā, 1896.

See Intro. to the Vaidyakśabdāśindhu by Karirāja Umeścandra Gupta, 1894.

VĀGBHATA II.

The next great authority in Hindu medicine is Vāgbhaṭa II, son of Śimha Gupta, an inhabitant of Sindh.¹ His work, Aṣṭāṅga Ḫṛdaya Saṁhitā, the author himself states, is based on the summary of Vāgbhaṭa the elder.² In the first chapter of Sūtra Sthāna, he acknowledges the help he received from the works of Agniveśa, Hārīta, Bhela, and others.³ The fact that Caraka is not referred to here as one of the sources of Vāgbhaṭa II has been taken advantage of by some to prove the posteriority of Caraka.⁴ They conclude that Agniveśa and Suśruta wrote their works long before him, and the Agniveśa Tantra was not called by the name of, and in fact was not as yet edited by, Caraka, at the

¹

भिषग्वरी वाभट इत्यभुनमे
पितामही नामधरोऽस्मि यस्य
मुतोऽभवत्स्य च सिंहगुप्तः
तस्याप्यहम् सिंघुम् जातजन्मा ॥

Aṣṭāṅga.

² Aṣṭāṅga Ḫṛdaya Saṁhitā, Uttara Sthāna, Ch. XL, v. 82.

See foot note 2, p. 18.

³ ब्रह्मा स्मृत्युषुषी वेदं प्रजापतिमजियहत् ।
सीऽचिवनौ तौ सहस्राचं सीऽचिपुत्रादिकान्मुनौन् ॥४॥
तेऽग्निवेशादिकांस्ते तु पृथक् तन्त्राणि तेनिरे ।
तेभ्योऽतिविप्रकीर्णेभ्यः प्रायः सारतरोच्चयः ।
क्रियतेऽष्टाङ्गहृदयं नातिसचेषविस्तरम् ॥५॥

Aṣṭāṅga Ḫṛdaya, Sūtra Sthāna, Ch. I.

⁴ "It would appear also that at the time Vāgbhaṭa lived, Agnivesha's work was not called by the name of Caraka, and Suśruta had also been written. Hence it follows that Caraka's edition of Agnivesha, that is the work now called Caraka, was probably edited after Suśruta had been written."

Dutt's Materia Medica of the Hindus, Intro., p. IX.

time Vāgbhaṭa II flourished. The argument is however not conclusive ; it only shows that the Agniveśa Tantra was available to Vāgbhaṭa II in its original form. No definite results can be expected from this *argumentum ex silentio*. Again it may easily be imagined, and I think it is the right view of the question, that Caraka lived and edited Agniveśa's work long before Vāgbhaṭa, the reason of Caraka being not mentioned in Vāgbhaṭa's book, is the fact that Caraka did not usurp the authorship of Agniveśa Tantra but clearly states at the end of each chapter the real nature of his share in the authorship of his book in the following words :—“Here ends the chapter of Agniveśa Tantra as corrected and edited by Caraka.” Many modern text books of medicine have been edited and improved, though the books are still called after the original authors. Moreover to make Caraka flourish after Vāgbhaṭa II would bring him to quite modern times.

We are however arguing on false premises. Though Caraka is not mentioned in the Sūtra Sthāna of Aṣṭāṅga Hṛdaya, his name occurs in the Uttara Sthāna.¹ So there can be no doubt that Caraka's edition of Agniveśa was current in India long before Vāgbhaṭa II wrote his Aṣṭāṅga Hṛdaya Saṁhitā.

¹ यदि चरकमधीते सद्भुवं सुश्रुतादि
प्रशिगदितगदानां नाममात्रेऽपि वाच्यः ।
अथ चरकविहीनः प्रक्रियायामखिनः
किमिह खलु करीतु व्यधितानां वराकः ॥४६॥

* * * *

ऋषिप्रणीते प्रीतिष्ठेन्मुक्ता चरकसुश्रुतौ ।
भेडायाः किं न पठ्यान्ते तस्माह् वाच्यं सुभाषितम् ॥५३॥

Editions.—There are various editions of the book but the following are reliable :—

1. By Dr. Anna Moreśvara Kunte, M.D., 2 vols., Bombay, 1880 ; 2nd Ed., 1891.
2. By Jibānanda Vidyāsāgara, Calcutta, 1882.
3. By Vijayratna Sen Kaviranjana, Calcutta, 1885-90.
4. By Ganeś Sastri Tartevidya, Bombay, 1888.
5. In Sanskrit and Bengali, with the commentary of Arūṇadatta by Vijayratna Sen Gupta, Calcutta, 1888.
6. In Sanskrit and Guzrathi by Behicharlal Nathuram, Ahmedabad, 1889.
7. In Sanskrit and Bengali by Kāliśa Cundra Sen Gupta, Calcutta, 1890-1892.
8. In Sanskrit and Hindi by Pandit Robi Dutta, Bombay, 1890.
9. In Sanskrit and Marathi by Ganeś Kṛṣṇa Garde, Poona, 1891.
10. In Sanskrit and Bengali by *Kavirāja* Binod Lāl Sen, Calcutta, 1891-1892.

*Commentaries.*¹—

1. Sarvāṅga Sundarī² by Arūṇadatta, son of Mṛgāṅkādatta, 1220 A.D.

¹ See Cordier's Vāgbhaṭa et L'Aṣṭāṅgahṛdaya Saṁhitā, P. 6.

² इति श्रीमृगाङ्गदच्चपुत्रं श्रीमद्दण्डच्चविरचितायां
सर्वाङ्गसुन्दराख्यटीकायां * * * * .

2. Āyurvedadarśayana (Dinacharyā Prakarana) by Hemadri or Kamadeva, Raja of Devagiri. It is available in parts only.
3. Aṣṭāṅgahṛdayayarddyota by Aśadhara Sallaxana.
4. Padārthacandrikā by Candracandana.
5. Saṅketamañjarī by Dāmodara.
6. Aṣṭāṅga Hṛdayatikā by Rāmanāth Vaidya.
7. Vālaprobodhikā (Anonymous).
8. Hṛdayabodhikā „
9. Pāthyā.
10. Vāgbhaṭartha Kaumudī by Hari Kṛṣṇa Sen Mullick.
11. Pradīpa by Jaśodānandan Sarkār, 1298 B.S.

VĀGBHATA III.

The author of Rasaratna Samuccaya in the Colophons at the end of each chapter identifies himself with Vāgbhaṭa II : "Here ends Book first (or so) of R.R.S. composed by Vāgbhaṭa, son of Simha Gupta, prince of physician." The salutation at the beginning of his book is strictly Buddhistic. The probable date of the book is "placed between the thirteenth and fourteenth centuries A.D."¹ "The chemical knowledge, as revealed in Vāgbhaṭa is almost on a par with that in the Suśruta," whereas the R. R. S. indicates an advanced state of that science. He quotes Rasārnava as a source of his information ; he does not mention opium as a medicine, and the Firanga roga and its treatment find no place in his book.

¹ P. C. Rāy's History of Hindu Chemistry, Intro., p. li.

MĀDHAVAKARA.

He is the author of the famous work on Pathology or Nidāna. His book was translated into Arabic by the order of Harun-Al-Rasid and so the most recent date that can be assigned to him is the seventh century A.D.¹ Thakore Saheb of Gondal identifies him with Mādhabācāryya, the celebrated author of Sarvadarśana Saṅgraha, the brother of Sāyana, the commentator of the Vedas.² I do not find any authority for such an assertion and here is an example of fallacious reasoning based simply on the identity of names. Mādhabācāryya and Sāyana lived in the twelfth century A.D. Mention should also be made of the view expressed by Dr. Hoernle as certain that Mādhavakara, the author of Nidāna and Vṛnda Mādhava, the author of Siddhayoga are one and the same person. He holds that Vṛnda is the real name, but he was known to the commentators as Mādhava, for his melodious diction. There is no proof given of this opinion, and we have reasons for not accepting it. However as he does not treat of surgical instruments, his work is not important to us.

CAKRAPĀNIDATTA.

Cakrapānidatta or more commonly Cakradatta in a Colophon³ has given an account of himself in his book called

¹ Jolly's Indian Medicine, ff. 5, 6, pp. 7-9.

² History of Aryan Medical Science, Ch. II, p. 35.

³ गौडाधिनाथ रसवल्याधिकारिपात्र—

नारायणस्य तनयः सुनयोऽन्तरङ्गात् ।

भानीरनु प्रथितलीप्रवलीकुलीनः

श्रीचक्रपाणिरिह कर्तृं पदाधिकारी ॥

Colophon in Cakradatta.

Cikitsā Sāra Saṁgraha: "The author of this work is Śri Cakrapāṇi who belongs to the family of Lodhravalī; and who is the youngest brother of Vānu and the son of Nārāyaṇa, the superintendent of the kitchen of Nayapāla,¹ the king of Gour." This book is arranged on the plan of Vṛnda in his Siddhayoga² which again follows closely as a companion volume to Mādhaba's Nidāna.³ The age of Cakradatta is about 1060 A.D.; and Vṛnda must have flourished between Mādhaba and Cakrapāṇi for he quotes the former while he is himself quoted by the latter. So the probable age of Vṛnda is the ninth century A.D. Besides being a celebrated author, Cakradatta wrote excellent commentaries of Caraka and Suśruta. His extant works are—

1. Cikitsā Sāra Saṁgraha or Cakradatta. A treatise on Medicine.

¹ For the date of Nayapāla, vide Cunningham's Archœo. Survey of India. III. P. 119; also J. A. S. LX. Pt. I. P. 46. Life of Atisa by S. C. Dās.

²

यः सिद्धियोगलिखिताधिकसिद्धियोग—

नवैव निजिपति केवलमुद्गरेदा ।

भट्टचयत्रिपथवेदविदा जनेन

दत्तः पतेत् सपदि मूर्धनि तस्य शापः ॥

Sloka at the end of the Cakradatta.

य इत्यादौ ।—सिद्धियोग इति हन्दकृतसंग्रहस्य संज्ञा, तत्त्विच्छितयीगमपेक्ष्याधिका ये च सिद्धियोग अत्र संयहे उक्तासानधिकयीगान् तत्रैव सिद्धियोगे निजिपति, तथा यो वा तानधिकसिद्धियोगानितः संयहादुद्गरेत् दूरीकृश्चात्, तस्य मूर्धनि दैदृशेन पुंसा दत्तः शापः पतेत् । कौटूषेन पुंसा ? भट्टचयत्रिपथवेदविद्या । कारिका हहृष्टीका चन्द्रटीकेति भट्टचयं, त्रिपथवेदः कठग्यजुः सामरूपः, तदिदा ॥

Sibadāsa Sen's Commentary.

³ हन्देन * * * * * संलिङ्गते गदविनिश्चयकमेन ॥

2. Cakradatta or Materia Medica. It treats on drugs applicable to a number of deseases.
3. Muktābali. This treatise on the nature and properties of medicinal drugs is ascribed to Cakrapāṇi.
4. Vānumati—Commentary on Suśruta Saṃhitā.
5. Cakratattwadīpikā—Commentary on Caraka Saṃhitā.

Editions.—

1. Cakradatta or Cikitsā Sāra Saṃgraha edited by *Kavirāja Pyāri Mohan Sen Gupta*, Calcutta, 1295 B.S.
2. Cakradatta with Bengali translation by *Candrakumār Dās Kavibhuṣan*.
3. Cakradatta with Bengali translation and with commentary of *Siva Dās Sen*, by *Jaśodā Nandan Sarkār*, 1302 B.S.

SĀRĀNGADHARA.

He wrote Sārāngadhara Saṃgraha. It is compiled from the works of Caraka, Suśruta, Vāgbhaṭa and others.¹ It is very popular in Western India. It treats on nosology and practice of Medicine. He was the son of Dāmodara and flourished in the fifteenth century A.D.

*Edition.—*By *Kavirāja Pyāri Mohan Sen Gupta*, Calcutta, 1296 B.S.

¹ प्रसिद्धयोगा सुनिभिः प्रयुक्ता
श्विकित्सकै यैं वहशीऽनुभूताः ।
विधीयते शार्ङ्गधरेण तेषां
सुसंग्रहः सञ्जनरञ्जनाय ॥

Commentary.—Sāraṅgadharatīkā: It is a commentary on the above work by Adhamulla.

BHĀVA MIŚRA.

About 350 years ago, a compilation was made by Bhāva Miśra, son of Lataka Miśra, an inhabitant of Benares, from the most celebrated medical works and was called Bhāva Prakāśa.¹ He lived about 1550 A.D. and was considered a “Jewel of Physicians and Master of Śāstras.” He mentions China root called Tob Chini² in the Vernacular as a remedy of Firaṅga roga or Syphilis³ which he describes for the first time in India. He was the first to make mention of certain drugs of foreign countries as Badhkshani Naspasi,

¹ आयुर्वेदाभिम्यादतिमितमन्यो योगरदानि यदा-
ल्लभ्वा से से निवन्धेदधुरखिलजन व्यधिविभंसनाय ।
तत्तद् ग्रन्थादगृहीतैः सुवचनमणिभि र्भावमिश्रशिकित्सा
शास्त्रे जाडाभ्वकारं प्रशमयितुमिमं सम्बिधते प्रकाशम् ॥

Bhāva Prakāśa, I. i.

इति श्रीमिश्र लटकतनय श्रीमन्मिश्रभावविरचिते

भावप्रकाशे षष्ठ प्रकरणं सम्पूर्णं ॥

Colophon at the end of Section I.

² हीपान्तरवचा किञ्चित्तित्तीणा वक्किदीपिष्टत् ।
विवन्धाभानशूलघ्नी शक्तन्मूत्रविश्रीधिनी ॥
वातव्याधीनपम्बारसुन्मादं ततुवेदनाम् ।
व्यपीडति विशेषेण फिरङ्गमयनाशिनी ॥

Bhāva Prakāśa, I. i.

³ फिरङ्गसज्जके देशे वाहुल्येनव थङ्गवेत् ।
तस्मात् फिरङ्ग इत्युक्ती व्याधिव्याधिविशारदैः ॥

Bhāva Prakāśa, II. iv.

Khorasani and Parasika Vacha (Acorus Calamus), Sulemani Kharjura (date fruit of Suleman),¹ and opium.

Editions.—

1. By Jībānanda Vidyāsāgara, Calcutta, 1875.
2. By Rasik Lāl Gupta.
3. By Kāliśa Candra Vidyāratna.

Besides these books, the number of Sanskrit medical works is simply legion ; many of them are daubed with fancy names and are excellent treatises on the different branches of medical science. But they are quite foreign to our purpose. I intend to publish in a separate volume short notices of the medical authors and their works, and so we need not dwell on them here.

¹ पारसीक यवानी तु यवानी सट्टशी गुणैः ।
विशेषात् पाचनी रुचा याहिणी मादिनी गुरुः ॥

Bhāva Prakāśa, I.

पारसीकवचा शुक्रा प्रीक्ता हैमवतीति सा ।
हैमवत्युदिता तद्वातं हन्ति विशेषतः ॥

Ibid.

उक्तं खसफलक्ष्मीरमाफूकमहिषेणकम् ।

Ibid.

चीनाक सज्जः कपूरः कफचयकरः स्मृतः ।

Ibid.

खञ्जुरी गोमनाकारा परदीपादिहागता ॥

Ibid.

CHAPTER II.

HOSPITALS AND DISPENSARIES.

Before entering into our proper subject, it would not be amiss to notice here two objects—Hospitals and Anæsthetics—which are essentially necessary for the development of surgical knowledge. We know from the Edict II of Aśoka that India during his reign was studded with hospitals not only for the treatment of human beings but also for the brute creations. But even before Aśoka, hospitals flourished in India. In Caraka we can trace the germ of such an institution though it was used for rich men and did not accommodate the public.¹

¹ दृढं निवातं प्रवातैकदेशं सुखप्रविचारमनुपत्यकं धूमातपरजसामनभिगमनीयमनिष्टानाच्च
शब्द-स्पर्श-रस-रूप-गम्भानां सोपानोद्भूमलमुषलवर्चःस्थानसानभूमिमहानसीपेतं बास्तुविद्या-
कुशलः प्रशस्तं गृहमेव तावत् पूर्वमुपकल्पयेत् ।

ततः श्रीलश्वैचानुरागदात्यप्रादक्षिणीपपन्नानुपचारकुशलान् सर्वकर्मसु पर्यवदातान्
सूपीदनपाचकस्तापकसंवाहकीत्यापकसंवेशकौषधपेषकांशं परिचारकान् सर्वकर्मस्वप्रति-
कुलान् । तथा गौतवादिचीज्ञापकज्ञीकगाथात्यायिकेतिहास-पुराणकुशलानाभिप्राय-ज्ञानतु-
मतांशं देशकालविदः परिषदांशं । तथा लावकपिङ्गलशश्हरिणैनकालपुच्छकमृगमाटकी-
रमान् । गाच्छ दीर्घौं श्रीलवतीमनातुरां जीवदत्सां सुप्रतिविहितटणशरस्पानौयाम् । जल-
पाचाचमनोदकी४मणिकपिठरघटकुम्भकुण्डशरावदर्ढीकपरीपचनमन्यानचेलमूककार्पासी-
र्णदीनि च श्यनासनादौनि चौपन्यस्तम्भज्ञारप्रतियहाणि सुप्रयुक्तात्तरप्रच्छदी-
पधानानि स्वापाश्यानि संवेशनोपवेशनस्त्रहस्तेदाभ्यङ्गप्रदेहे परिषेकानुलेपनवमनविरेचना-
स्यापनानुवासन-शिरीविरेचनमूर्चोद्वारकर्मणामुपचारसुखानिसुप्रचालितोपधानाश्च स्त्रियाखर-
मध्यमा दृशद शस्त्राणि चौपकरण्यार्थानि ।

‘धूमनेत्र’ वस्तिनेत्रचोत्तरवस्तिकच्च । कुशहस्तच्च तुलाच्च मानभाण्डच्च घृततैलवसामञ्जस्त्रौद्र-
फाणितलवणेभ्यनीदक-मधुसुरासौबौरकतुषीदकमैरेयमेदकदधिमण्डेदिवहानगाम्भूमूत्राणि च ।
तथा शालिषट्टिकमुद्भमाषयवतिलकुलत्यवदरमद्वीकापरूपकाभयामलकविभीतकानि नाना-
विधानि च स्त्रेहस्तेदापकरणानि द्रव्याणि तत्रैवीर्द्धहरणानुलोभिकीभयभाङ्गि संग्रहनीयदीप-
मीयपाचनीयीपश्मनीयवातहराणि समाख्यातानि चौषधानि यच्चान्यदपि किञ्चिद्ग्रापदः
परिसंद्वायीपकरणं विद्यते यत्र प्रतिभीगाथं तत्तदुपकल्पयेत् ॥

He advises us as follows :—The engineer is to erect a strong and spacious building, well-ventilated at one part, the other part being free from draughts. The scenery should be pleasing and one should feel happy to walk in it. It must not be behind any high building, nor exposed to the glare of the sun. It should be inaccessible to smoke and dust. There must not be anything injurious to our senses as regards sound, touch, taste, form and smell. There should be stairs, large wooden mortars and pestles ; and there must be additional bare ground for the construction of a privy, bath-room and kitchen. The staff should consist of servants and companions. The servants should be good, virtuous, pure, fond, clever, generous, well trained in nursing, skillful in works, able to cook rice and curries well, competent to administer a bath, expert masseur¹, trained in raising and moving a patient, dexterous in making or cleaning beds, practiced in the art of compounding medicines and willing workers not likely to show displeasure to any order. The companions should be good singers and musicians, fluent speakers, well-versed in distichs, ballads, tales, history and mythology, well-acquainted with the design of a patient's nods or signals, agreeable and should have knowledge of the season and the locality. The various kinds of animals

¹ From the aeeounts of Megasthenes, we learn that four attendants used to massage him (Candragupta) with ebony rollers during the time that he was engaged in disposing of eases. Such an attendant (*sāṁvāhaka*) is a minor eharaeter in the Toy Cart or little Clay Cart, drama, transl. by Ryder, in Havard Oriental Series, Vol. IX, 1905—Smith's Early History of India, 2nd Ed., Page 122. Footnote. We also find in the Kāmandikya Nītisāra that the king is eautioned against shampooers who have the opportunity of poisioning him.

सूदव्यञ्जनकर्त्तरसत्पका व्ययकास्था ।

प्रसाधका भीजकाश्च गावसंबाहका अपि ॥

should always be kept in stock such as Lāva (*Perdix Chinensis*), Kapiñjala (partridge), hares, sheep and the different kinds of deeris, Ena (the black antilope) blacktailed deer, and Mṛgamātrka. There should be a diary attached to the building. The cow should be good natured and healthy, and should yield profuse milk. The calves must be living. There should be stocked for them potable water and hay in a clean fold. In that building must be kept the following necessary articles :—

Water vessels, washing basins, tubs, jars, dishes, ghata, (small jars) kumbhī, kumbha (larger and smaller vessels), kundu (jug or pitcher), soraba (earthen basins), spoons or ladles, cooking utensils, churning rods, cloth, thread, cotton, wool, bedding and āsana (seats). Near them should be placed drinking vessels of gold and spittoons. The bedding should consist of a broad carpet, bed-sheet, pillows, and a bedstead. There should be collected good furnitures for beds and seats ; and also utensils and appliances for application of oleaginous medicines, heat, oil, ointment, bath and perfumeries, and for the acts of emesis, purgation, draining of the brain, injection into the rectum, defaecation and urination (*i.e.* Vastiyantrā, urinal, bed-pan &c.). The blunt and sharp instruments and their accessories, well-washed mullers and whetstones of different degrees of smoothness—polished, plain or rough—should be near at hand ; the tubular instruments for fumigation, inhalation and injection into the rectum, urethra and vagina, should be available there ; and the following articles are also to be stocked :—brushes and brooms, weighing scales and weights, ghee (melted butter), oil, fat, marrow, honey, molasses, salt, wood, water, spirituous liquor formed by steeping husked grains of barley in water, or by boiling together the husks of fried māskalāya

(pulse of Phaseolous Rox.), barley and water, spirituous liquor from the blossoms of Lythrum Fruticoscence with sugar, spirit distilled from the different sorts of grains, curdled milk, rice, gruel, whey, sour liquid produced from the acetous fermentation of powdered paddy, and the various kinds of urines of animals. Different kinds of rice such as Sāli (or that reaped in cold season) and Saṣṭhika (or that grown in hot weather in low lands and reaped within sixty days of its sowing), Mudga (Phaseolus mungo), Māṣa (Phaseolus Rox.), Yava (Hordeum Vulgare), sesame (Seasamum Indicum), Kullatha (Dolichos Biflorus), plums (Zizyphus Jujube), raisins (Vitis Vinifera), Paruṣa (Grewia Asiatica), Abhayā (Chebulic Myrobalan), Āmlakī (Phyllanthus Emblica), Vibhitaka (Terminalia Bellerica) and other classes of medicaments, as oils, diaphoretics, sternutatories, cathartics, emetics, purgatives, astringents, stomachics, digestives, calmatives, carminatives and various other forms of medicines, are required for treatment. Besides these, there must be stored the antidotes to poisons caused by overdoses of medicines and other appliances likely to add to the patient's comfort.

To this may be compared the description of the Greek iatrium, which is mentioned in the Hippocratic treatise, *De Medicio*. He directs that "it should be so constructed that neither the wind nor sun might prove offensive to the patient, and goes on to enumerate the various articles which it should contain, such as scalpels, lancets, cupping-instruments, trepans, raspatories, with bandages and medicines."¹

¹ Works of Hippocrates, Syd. Soc. Vol. II, page 470, Footnote

Suśruta gives us a list of appliances¹ required in surgical operations :—

1. Blunt Instruments.
2. Sharp Instruments.
3. Potential Cautery.
4. Actual Cautery.
5. Śalākā or rods.
6. Horns.
7. Leeches.
8. Hollow bottle gourd.
9. Jāmbav-ousṭha [a bougie of blackstone, the extremity of which is shaped like the fruit of the Jambul tree (*Urginea Jāmbolana*)].
10. Cotton.
11. Pieces of cloth.
12. Thread.
13. Leaves.
14. Materials of bandaging.
15. Honey.
16. Ghee, or clarified butter.
17. Suet.
18. Milk.
19. Oils.
20. Tarpan.—flour of any perched grain or condensed milk etc. mixed with water to mitigate thirst.
21. Decoctions.
22. Liniments.
23. Plasters.
24. Fan.
25. Cold and hot water.
26. Iron pans, kalasi and other earthen vessels; beddings and seats.
27. Obedient, steady and strong servants.

The Lying-in-room.—Caraka says : “Before the ninth month of pregnancy, the lying-in-room should be constructed. The land should be cleaned of bones, gravels and potsherds. The ground selected should be of auspicious colour, taste and smell. The gate of the house should face towards the east or the north.² There must be a store of wood such as Vilva (Ægle

¹ अतोऽनामतं कर्म चिकीर्षता बैद्येन पूर्णमेवीपक्ष्यथितव्यानि तद्यथा यन्वशस्त्रचाराग्रिशलाकाश्वर्जलौकालावूजाम्बबोधपिचुप्रीतसूत्रपत्रपद्मधूष्टतवसापयस्तैलतर्पनकषायलेपन कल्कव्यजनशीतीणीदक कटाहृदीनि पांकर्मणश्च म्लिग्धाः स्थिरा वलवन्तः।

Suśruta Saṁhitā. I. v.

² “The best sort of ground should abound with milky trees, full of fruits and flowers; its boundary should be of a quadrangular form, level and smooth, with a sloping declivity towards the east producing a hard sound, with a stream running from left to right, of an agreeable doour, fertile, of an uniform

Marmelos), Tinduka (*Diospyros Embryopteris*), Inguda (*Balanites Rox.*) Bhallakaka (*Senecarpus Anacardium*), Vāruna (*Ocimum Basilicum*), Khadira (*Acacia Catechu*) or wood of other kinds said to be auspicious by a Brāhmaṇa versed in the Atharvaveda; and there must be a sufficient provision for clothes, liniments, and covers. For the pregnant woman, be careful to have a fire-place, water, pestles and mortars, a privy, a bathing place, and ovens. These should be constructed according to the science of engineering and should be pleasant with regard to the season. There should be collected clarified butter, oil, honey, different kinds of salts as rock salt, sonchal salt, and black salt, Viḍāṅgas (*Embelic Ribes*), treacle, Kuṭha (*Saussurea Lappa*), Kilima (*Pinus Deodara*), Nāgara (dried root of *Zinziber Officinale*), Pippalī (*Piper Longum*), its root, Hasti-pippalī (*Scindaspus Officinalis*), Mandukparni (*Hydrocotyle Asiatica*), Elā (*Elettarium Cardamomum*), Lāngolī (*Gloriosa Superba*), Vāca (*Acorus Calamus*), Cavya (*Piper Cava*), Chitraka (*Plumbago Zeylanicum*), Chiravilva (*Pongamia Glabra*), Hingu (*Ferrula Assafætida*), Sarṣapa (Mustard seeds), Laśuna (*Allium Sativum*), finely or thickly powdered rice, Kadamba (*Anthocephalous Kadamba*), Ātasi (*Linum Usitatissimum*), Vallija (*Cucurbita Pepo*), Bhurya (*Betula Bhojpatra*), Kulatha Dolichos *Uniflorus*), Maireya (a spirituous liquor from the blossoms of *Lythrum Fruticoscence*) and Āshava (Vinous fermented liquor from sugar or molasses, Rum). Also collect two pieces of

colour containing a great quantity of soil, producing water when dug to the height of a man's arm raised above his head, and situated in a climate of moderate temperature."

stone (muller and stone slabs), two pestles, two mortars, an ass, a bullock, two sharp needles of gold and silver, two skeins of threads, sharp instruments of steel, two wooden bedsteads (*Ægle Marmelos*), and wood (*Tinduka* and *Ingudi*) for easily igniting fire. The female attendants should be mothers of children, and friends and relatives of the patients. They must be fond of her, skillful in work, intelligent, jolly, laborious full of tender love for the children and a favourite of the mother.”¹

The Child's Room :—He continues—“ The engineer is to construct a room, spacious, beautiful, full of light, well-ventilated but free from draughts, strong, and free from beasts of prey, animals with fangs, mice and insects. There should be kept water, mortar and separate places should be assigned for bathing, cooking, urination and defæcation. It should suit the season of the year. The beddings, seats and covers should be comfortable and suitable to the season. Auspicious ceremonies should be performed in that room such as *homa*, expiations and presents to gods, for the proper protection of the child ; and there should be present pious old men, doctors, and devoted

¹ प्राक् चैवासप्ता नवमान्मासात् सुतिकागारं कारयेदपहतस्थिशर्कराकपालेदेशं प्रशस्त-
रूपरसगन्धायां भूमौ प्राग्द्वारसुदग्द्वारं वा । तत्र वैत्वानां काषाणां तिन्दुकैङ्गुदानां भज्ञात-
कानां वारुणानां खदिरानां वा यानि चानान्यपि व्राज्ञणाः शंसेयुरथर्ववेदविदस्त्रिसनालेप-
नाक्षादनापिधानसम्पदुपेतं तत् । वास्तु-विद्या-हृदययीगेनाग्निसलिलोलुखलवर्चःस्यानस्त्रानभूमि-
महानसम्तुसुखञ्च । तत्र सर्पिसैलमधुसैन्धवसौवर्चलकालबन्धविडङ्गुड़कुष्ठकिलिमनागर-
पिप्पलीमूलहस्तिपिप्पलीमण्डकपर्णेणलालाङ्गलीवचाचव्यचिचकचिरवित्व-हिङ्गुस्थर्प लशुनकन-
कनिकानीपातसीवल्विजभूज्ञाः कुलत्यमैरेयसुरासवाः सत्रिहिताः सुः ॥ वथाश्मानौ
इौ हौ चण्डमूष्टले हौ उलूखले खरी वृषभश हौ च तीक्ष्णौ सूचौपिप्पलकौ सौवर्णराजतौ हौ
शस्त्राणि च तीक्ष्णायसानि हौ च विलमयौ पर्थङ्गौ तैन्दकैङ्गुदानि काषाण्यग्रिसम्बुद्धणानि
स्त्रियश वह्नी वहशःप्रजाताः सौहार्दयुक्ताः सततमनुरक्ताः प्रदक्षिनाचाराः प्रतिपन्निकुशलाः
प्रकृतिवत्सलास्त्रकविषादाः क्लेशसहिष्णवोऽभिमता व्राज्ञणशाथर्ववेदविदी यच्चान्वदपि तत्र
समर्थं मन्येत यच्च व्राज्ञनाः व्रूयः स्त्रियश वङ्गास्त्रत्कार्यम् ॥

attendants constantly. The child's bed, covers and sheets should be soft, light, pure and scented. These should always be free from sweat, dirt, worms or bugs, urine and faeces. If repeated change of new clothes be impossible, the soiled coverings should be well washed and the beddings well purified with steam and thoroughly dried before they are used again. To purify or sterilise the dress, beddings, coverings and sheets by fumigation use the following medicines with clarified butter:—Barley (*Hordeum Vulgare*), mustard seeds, linseeds, assafœtida, Guggula (*Balsamodendron Mukul*), Vāca (*Acorus Calamus*), Coraka (*Andropogon Acicularis*), Vayasthā (*Chebulic Myrobalan*), Golomi (*Panicum Dactylon*), Jatilā (*Nardostachys Jatamansi*), Palankasā (a variety of Guggula), Aśoka (*Saraca Indica*), Rohinī (*Picerorrhiza Kurroa*) and sakes' skin.....A variety of toys to please the child should be at hand and these should be coloured, light, musical, beautiful and must not be sharp pointed. They should be of such a size and shape as cannot be put into the child's mouth or do not terrify or kill the child.”¹

¹ अतोऽनन्तरं कुमारागारविधिमनुव्याख्यास्यामः ॥ वास्तुविद्याकुशलः प्रशस्तं रसमतमस्कं निवातं प्रवतैकदेशं दृढमपगतध्वापदपशुदंष्ट्रिमूषिकपतङ्गं सुसंविभक्तसलिलोदूखलमूच्चर्वच्चः-स्थानक्षानभूमिमहानसमृतमुखं यथतु श्यनासनास्तरणसम्पन्नं कुर्यात् । तथा सुविहित-रक्तविधानवलिमहङ्कारीमप्रायश्चित्तं शुचिब्रह्मवैद्यानुरक्तजनसम्पूर्णमिति । कुमारागारविधिः ॥ श्यनास्तरणप्रावरणानि कुमारस्य मदुलघुशुचिसुगम्भीनि स्युः । स्वेदमलजन्तुमन्ति मूच्चपूरी-षीपसृष्टानि च वजर्जन्ननि स्युः ॥ असति सम्बैद्येषां तान्येव च सुप्रकालितपीधानानि सुधूषितानि सुगड्गुणकाञ्चुपयोगं गच्छेयुः । धूपनानि पुनर्वासां श्यनास्तरणप्रावरणात्त्वं यवसर्पपातसौहिङ्गुण्गुलवचाचीरकवयःस्थागोलीमौजटिलापलङ्घाशीकरीहिणीसर्पनिर्मार्कानि धृतसमयुक्तानि स्युः ॥ मण्यथ धारणीयाः कुमारस्य खङ्गरुगवयवृषभानां जीवतामेव दक्षिणेष्वी विषाणोभ्येऽयाणि गृहीतानि स्युः । मन्त्राद्याशैषधयी जीवकर्षभकौ च याच्यव्यन्यानि ब्राह्मणाः प्रशंसेयुः । क्रीडनकानि खल्वस्य तु विचित्राणि धीषवन्त्यभिरामाणि अगुरुण्यतीक्ष्णागानि अनास्यप्रवेश्येनि अप्राणहराणि अविवासनानि स्युः ॥

Suśruta directs that there should be a particular room provided for patients who have undergone surgical operations.¹ "Patients suffering from surgical diseases as inflammatory swelling, wounds &c. should, from the very commencement of their illness, confine themselves inside a clean house, situated in a wholesome locality, free from draughts and not exposed to the glare of the sun. For, in such a building, constitutional, mental and accidental diseases are not likely to occur. In that room, the bed for the patients should be soft, spacious, and well-arranged. The patient should lie down, his

¹ ब्रह्मिनः प्रथमसेवागरमनिच्छेत्तचागारं प्रशस्तवास्त्वादिकं कार्यं ।

प्रशस्तवास्तुनिगृहे शुचावातपवर्जिते ।

निवाते न च रीगाः सुगः शारीरागन्तुमानसाः ॥

तस्मिन् शयनमस्थाधं स्वास्तीर्णं मनोज्ञं प्राक्शिरस्कं सशस्त्रं कुर्वीत ।

सुखचेष्टाप्रचारः सग्रात् स्वास्तीर्णं शयने ब्रनी ।

प्राचां दिशि स्थिता देवास्तपूजार्थं नतं शिरः ॥

तस्मिन् सुहृद्भिरनुकूलैः प्रियम्बदैरुपास्यमानी यथेष्टमासीत् ।

सुहृदी विच्चिपत्वाशु कथाभिर्वणवेदनाः ।

आश्वासयन्ती वहशस्तनुकूलाः प्रियम्बदाः ॥

न च दिवानिद्रावशगः सग्रात् ।

दिवासप्राद्रुषे कर्णुर्गावाणां गौरवं तथा ।

ब्रयथुर्बेदनारागः स्वावैव भृशं भवेत् ॥

उत्थानसंवेशनपरिवर्तनचंक्रमणीचैर्भाषणादिषु चात्मचेष्टास्प्रभक्तो ब्रणं संरक्षेत् ।

स्थानासनं चंक्रमणं यानयानातिभाषणं ।

ब्रणवान्न निषेवित शक्तिमानपि मानवः ॥

उत्थानायासनं स्थानं श्रव्यां चातिनिषेविता ।

प्राप्तुयान्मारुतादङ्गे रुजस्तमादिवर्जयेत् ॥

गव्याणां च स्वीर्णां सन्दर्शनमस्थावणमस्पर्शनानिदूरतः परिहरेत् ।

head pointing towards the east, and keep there some weapon for his own protection. On such a bed, the patient can lie comfortably and turn to his sides at pleasure. He should be surrounded by his dear friends, for their sweet words relieve the pain of inflammation. The female friends, however, should be avoided and kept at a distance. He should observe strictly the orders of the surgeon as regards his food, drink and mode of living. He should have his hairs clipped and nails pared short, be pure in his person, put on white clothes and devote himself to religious duties. A light should be kept burning; and garlands of flower, weapons &c., should be provided in the room to ward off the demons. He should be cheered and inspired by pleasant stories; and the physicians and the priests should attend the patient morning and evening. Pastils made of Sinapis Nigra and Azadirachta Indica with clarified butter and salt, should be burnt in the room morning and evening for ten days continually. The inflamed part should be fanned with a *cāmar* or yolk-tail. Sleep during the day, exercise and sexual intercourse must on no account be indulged in."

Suśruta also describes the kitchen of the king thus:— "That is the proper kitchen which is built on good ground, towards an auspicious quarter, full of utensils for cooking, spacious, clean, provided with windows guarded by a network, frequented by friends, cleared well of grass furnished with a canopy, purified by auspicious ceremonies, and managed by men and women of good character. The superintendent of the kitchen should, like the doctor, be noble and virtuous. The cook and servants should be pure, noble, capable, mild, good looking, engaged in their respective duties, high-minded, should have their hairs and nails cut short, steady,

well-bathed, of subdued passion, well-dressed, obedient and have their heads well-covered."

"The doctor in charge of the kitchen should be of noble family, religious, friendly, a clever manager for getting king's food properly prepared, ever careful for his health, non-avaricious, simple, fond, grateful, good-looking, cool-tempered, well-behaved, not proud and envious, laborious, of subdued passion, forgiving, pure, of good character, kind, intelligent, not easily fatigued, always loving, well wisher, capable, bold, clever, skillful, not unreasonably tender, provided with medicines and well proficient in the art of healing."¹

¹ कुलौनं धार्मिकं स्त्रिगचं सुभृतं सततीत्यितं ।
अलञ्चं अशठं भक्तं कृतघ्नं प्रियदर्शनं ॥
क्रींधपारुषमात्सर्वं मदालसप्रविवर्जितं ।
जितेन्द्रियं त्रावत्तं शुचिं शौलदयान्वितं ॥
मेधाविनमसंशान्तमनुरक्तं हितैषिणं ।
पटुं प्रगल्भं निपुणं दक्षं मायाविवर्जितं ॥
पूर्वोक्तैश्च गुणैर्युक्तं नित्यं सत्रिहितागदं ।
महानसे प्रयुज्ञीत वैद्यं तदिद्यपूजितं ॥
प्रशस्तदिग्देशकृतं शुचिभारुडं महक्षुचिं ।
सजालकं गवाच्चाट्ठा मात्मवर्गं निषेवितं ॥
विकच्चस्तसंस्तृष्टं सवितानं कृताच्चनं ।
परीचित स्त्रीपुरुषं भवेच्चापि महानसं ॥
तत्राभ्यक्तं नियुज्ञीत प्रायो वैद्यगुणान्वितं ।
शुचयो दक्षिणा दक्षाः विनौताः प्रियदर्शनाः ॥
सविभक्ताः सुमनसी नीच केशनखाः स्थिराः ।
स्नाताट्ठः संयमिनः कृतीशीषाः सुसंयुताः ॥
तस्याचाज्ञा विधेयासु विविधाः परिकर्मिणः ।
आहारस्थित यथापि भवन्ति प्राणिनी यतः ॥
तस्मान्महानसे वैद्यः प्रसाद रहिती भवेत् ।
माहानसिक वीढारः सौपौदनिक पौपिकाः ॥
भवेयुक्तं व्यवशगा ये चाप्यन्ये तु किञ्चन ।
इङ्गितङ्गी मनुष्याणां वाक्चेष्टमुखवैकृतैः ॥

In the Kāmandakiya Nītisāra, we find the king advised to take thoroughly examined food, and to be surrounded by physicians well-versed in the science of Toxicology;¹ and again it is said that king should take his medicines, cordials, and edibles after having his medical attendants tasted them.² The king is advised to kill his enemy by weaning over his physician or by administering poisonous liquids.³

In the Mahāvāgga⁴ we find the qualities of a good patient and a good nurse described :—

“ 6. What are five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon—

When he does do what is good for him ; when he does know the limit (of the quantity of the food) that is good for him ; when he does take his medicine, when he does let a nurse who desires his good, know what manner of disease he has, or when he is getting worse that that is so, or when it is getting better that that is so ; and when he has become able to bear bodily pains that are severe, sharp, grievous, disagreeable, unpleasant and destructive to life. These are the five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon.

¹ विषप्नैरुदकैः स्नातः विषप्नमनिभूषितः ।
परीचितं समश्रीयाज्ञाङ्गुलाविद्विषगवतः ॥ १० ॥

Kāmandaka Nītisāra vii. v. 10.

² श्रौषधानि च सर्वानि पानं पानीयमेव च ।
तत्कत्पकैः समाप्ताय प्राश्रीयाङ्गीजनानि च ॥ २७ ॥

Ibid. vii. v. 27.

³ भिषभेदेन वा शत्रुं रसदानेन साध्ययेत् ॥ ७० ॥

Ibid. IX. v. 70.

⁴ Mahāvāgga viii. 26, 6 & 8 (Sacred Books of the East),

8. There are five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task—when he is capable of prescribing medicines ; when he does know what (diet) is good and what is not good for the patient, serving what is good and not serving what is not good for him ; when he does wait upon the sick out of love, and not out of greed ; when he does not revolt from removing evacuation, saliva or vomit ; when he is capable of teaching, inciting, arousing and gladdening the patient with religious discourses. These are the five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task.”

There is also good deal of evidence to show that medicines were distributed free to the poor and to the pious men. When Viśakhā asked for eight boons of the Buddha, she mentioned amongst them the privilege of bestowing her life long “ food for the sick, food for those who wait upon the sick and medicines for the sick ” and explained her reasons as follows¹ :—

“9. Moreover, Lord, if a sick Bhikkhu does not obtain suitable foods, his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the diet that I shall have provided for the sick neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Samgha my life long with diet for the sick.

Moreover, Lord, a Bhikkhu who is waiting upon the sick if he has to seek out food for himself, may bring in the food (to the invalid) when the sun is already far on his course, and he will lose the opportunity of taking his food. But when

¹ Mahāvāggā VIII, 15.9.

he has partaken of the food I shall have provided for those who wait upon the sick, he will bring in food to the invalid in due time and he will not lose the opportunity of taking his food. It was this circumstances, Lord, that I had in view in desiring to provide the Samgha my life long with food for those who wait upon the sick.

10. Moreover, Lord if a sick Bhikkhu does not obtain suitable medicines his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the medicines which I shall have provided for the sick, neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Samgha, my life long with medicines for the sick."

The Edict No. II of Aśoka clearly shows that charitable institutions were common in India, during his reign. The Edict runs as follows :—

" Everywhere in the kingdom of the king Piyadasi, beloved of the gods, and also of the nations who live in the frontiers such as the Cholas, the Pandyas, the realms of Satyaputra and Keralaputra, as far as Tambapani, (and in the kingdom of) Antiochus, king of the Greeks and of the kings who are his neighbours, everywhere the king Piyadasi, beloved of the gods, has provided medicines of two sorts, medicines for men and medicines for animals. Wherever plants useful either for men or for animals were wanting they have been imported and planted. Wherever roots and fruits were wanting, they have been imported and planted. And along public roads, wells have been dug for the use of animals and men."

We also learn from Houen Tsang's account that Śilāditya II

(610 - 650 A. D.) was inclined towards Budhism and he forbade the slaughter of living animals, built *stupas*, and "in all the highways of the towns and villages throughout India, he erected hospices, provided with food and drink, and stationed there physicians with medicines for travellers and poor persons round about, to be given without any stint."¹

He also mentions about the father of the Bhikkhu Śrutavimśatikoti, that "from his house to the snowy mountains, he had established a succession of rest-houses, from which his servants continually went from one to the other. Whatever valuable medicines were wanted, they communicated the same to each other in order, and so procured them without loss of time, so rich was this family."²

He also mentions charitable institutions called *Punyaśālās* as common in India. "There were formerly in this country (Tsch-kia-Takka) many houses of charity (goodness or happiness, *Punyaśālās*) for keeping the poor and the unfortunate. They provided for them medicines and food, clothing and necessaries; so that travellers were never badly off."³

Again he says : "Benevolent kings have founded here (Mo-ti-pil-lo or Matipura) a house of "merit" (*Punyaśālās*). This foundation is endowed with funds for providing choice food and medicines to bestow in charity on widows and bereaved persons, on orphans and the destitute."⁴ A similar *Punyaśālā* or hospice was in K'ei-P'an-to (Kabandha).⁵ In describing

¹ Beal's Record, Vol. I, p. 214.

² *Ibid*, Vol. II, p. 188.

³ *Ibid*, Vol. I, p. 165.

⁴ *Ibid*, Vol. I, p. 198.

⁵ *Ibid*, Vol. II, p. 303.

Multan he says: "They have founded a house of mercy (happiness), in which they provide food, and drink, and medicines for the poor, and sick, affording succour and sustenance."¹ Of Śilāditya he says : "Every year he assembled the Sramanas from all countries, and on the third and seventh days he bestowed on them in charity four kinds of Alms (*viz.*—food, drink, medicine, clothing)."²

Fa Hian (405-11 A.D.), a contemporary of Candragupta Vikramāditya, describes the charitable dispensaries in the town of Pāṭaliputra thus:—"The nobles and householders of this country have founded hospitals within the city to which the poor of all countries, the destitute, cripple and the diseased may repair. They receive every kind of requisite help gratuitously. Physicians inspect their diseases, and according to their cases order them food and drink, medicines or decoctions, every thing in fact that may contribute to their ease. When cured,—they depart at their convenience."³ Smith remarks: "No such foundation was to be seen elsewhere in the world at this date ; and its existence, anticipating the deeds of modern Christian charity, speaks well both for the character of the citizens who endowed it, and for the genius of the great Aśoka whose teaching still bore such wholesome fruit many centuries after his decease. The earliest hospital in Europe, the Maison Dieu of Paris, is said to have been opened in the 7th centuries."⁴

"Upatisso, son of Buddha Das, builds Hospitals for cripples,

¹ Beal's Record, Vol. II, p. 274.

² *Ibid.*, Vol. I, p. 214.

³ *Ibid.*, Vol. I, Intro. leii.

⁴ Smith's Early History of India, 2nd Ed., p. 280.

for pregnant women, and for the blind and diseased.¹ Dhatushena builds Hospitals for cripples and sick². Buddha Das³ himself ordained a physician for every ten villages on the high road, and built assylums for the crippled, deformed and destitute.”⁴

The animal Hospitals or Piñjrāpoles which still exist at Ahmedabad, Surat, and Sodepore in Bengal, and elsewhere may be regarded as the survivals of the institutions founded by the Maurya monarch. The following account of the Surat Hospital in the 18th century is from the pen of Hamilton:—

“The most remarkable institution in Surat is the Banyan Hospital, of which we have no description more recent than 1780. It then consisted of a large piece of ground enclosed by high walls, and sub-divided into several courts or yards for the accommodation of animals. In sickness they were attended with the greatest care, and here found a peaceful assylum for the infirmities of old age.

“When an animal broke a limb, or was otherwise disabled, his owner brought him to the Hospital, when he was received without regard to the caste or nation of his master. In 1772 this hospital contained horse, mules, oxen, sheep, goats, monkeys, poultry, pigeons, and variety of birds; and also an aged tortoise, which was known to have been there seventy-five years. The most extraordinary ward was that appropriated for rats, mice, bugs, and other noxious vermins for whom suitable food was provided.”⁵

¹ Mahāwanśo, p. 249.

³ *Ibid*, p. 245.

² *Ibid*, p. 256.

⁴ Cunningham’s Bhilsa Topes, p. 54, foot note.

⁵ Hamilton’s Description of Hindustan (120) Vol. I, p. 718, quarto ed., Crooke. Things Indian, Art. Pinjrapole, (Murray 1906).

We quote here from Hemādri the opinions of the sages and the Purāṇas as to the merit of the founder of a hospital¹ :—

Visvāmitra.

There is no gift more precious than the gift of cure ; therefore it should be given freely to the sick to augment one's good fortune. He who gives medicines, diet, food, oil for smearing and shelter to the sick, becomes free from all diseases.

Samvartta.

The giver of medicines, oleaginous remedies and food for the cure of the sick, becomes free from all diseases, happy and long-lived.

Agastya.

Those who give rice and medicines freely attain happiness, being free from disease.

Saura Purāṇa.

He, who gives medicines to the sick to cure their diseases always remains healthy, long-lived and happy.

¹ अथ आरोग्यदानं ।

तत्त्वारोग्यदानलाभ दुच्यते ।

आहू विश्वामित्रः ।

आरोग्यदानात्परमं न दानं विद्यते क्वचित् ।

अतीदेयं रुजार्त्तानामारीयं भाग्यहङ्कये ॥

अौषधं पथ्यमाहारं तैलाभ्यङ्गप्रतिश्रयं ।

यः प्रयच्छति रीगिभ्यः सभवेद्वाधिवर्जितः ॥

संवर्त्तः ।

अौषधं स्वेह-माहारं रीगिणां रीगशालये ।

ददानो रीगरहितः सुखी दीर्घायुरेव च ॥

Nandi Purāna.

The high-souled man who gives the Brahmins collyrium in charity to cure the diseases of the eye, goes to the Sun (after death) and becomes free from eye deseases, fine-looking and fortunate.

Good health is a step to the acquirement of religious merit, wealth, pleasure and final emancipation, and so the man who bestows cure to the sick and also he who erects a hospital equipped with good medicaments, dresses, learned doctors, servants and rooms for students, always gain them. The doctor should be well-versed in the religious treatises, experienced, familiar with the actions of medicines, a discriminator of the colour of the roots of the herbals and well-acquainted with the

अगस्त्यः ।

अन्नौ-षधप्रदातारः सुखं यान्ति निरामयाः ।

सौर पुराणे ।

रीगिणो रीगशान्त्यर्थमौषधं यः प्रयच्छति ।

रोगहीनः स दीघांयुः सुखोभवति सर्वदा ॥

नन्दि पुराणे ।

अन्ननं यो नरीदद्यादक्षीर्याधिनिहत्ये ।

विप्राय स पुमान् याति सूर्यलीकं महामतिः ।

आरोग्यनयनी दिव्यः सुभगी जायते नरः ॥

तस्मिन्नेव पुराणे ।

धर्मा-र्थ-काम-मीक्षाणां आरोग्यं साधनैयुतः ।

अतस्त्वारीग्यदानेन नरो भवति सर्वदा ॥

आरोग्यशाला कुरुते महौषधपरिकृदां ।

विदग्धवैद्यसंयुक्ता मृत्यावस्थसंयुता ॥

proper season of raising them from the ground, well-trained with the qualities of the juices, (their strength and actions), sali rice, meat and medicaments, trained in compounding medicines, one who knows well of the physique of men by intelligence, one who knows the temperament and the qualities of the diet, a pathologist who is not idle, well acquainted with the remedial agents for the premonitory signs and sequelæ of diseases, proficient in the requirements of time and place, well-read in the medical text-books—the Ayurveda with its eight divisions and an expert in curing diseases by domestic remedies (prepared from handful of common ingredients).

The pious man who erects such a hospital in which the services of good physicians of this nature are retained, becomes celebrated as the virtuous, the successful and the intelligent

वैद्यस्तु शास्त्रवित् प्राची दृष्टौषधपराक्रमः ।

आौषधीमूलवर्णज्ञः समुद्भरणकालवित् ॥

रसवीर्यविपाकज्ञः शालिमांसौषधीगणे ।

योगविदेहिनां देहं यो धिया प्रविशेदुधः ॥

धातुपथ्यमयज्ञश निदानविदतन्त्रितः ।

व्याघीनां पूर्वलिङ्गज्ञस्तुत्तरविधानवित् ॥

देशकालविधानज्ञश्चिकित्साशास्त्रवित्तथा ।

अष्टाङ्गायुर्वेदवेच्छा मुष्टियोगविधानवित् ॥

अष्टावङ्गानि आयुर्वेदस्य ।

यथाग्रल्यं शालाक्यं कायचिकित्सा भूतविद्या कौमारभृत्यमगदतन्त्र रसायणतन्त्र वाजी-
करणतन्त्रमिति सुशुतीक्ष्णानि ।

एवं विधः शुभी वैद्यी भवेद्यत्तमियोजितः ।

आरोग्यशालामवन्तु कुर्थादीधर्मसंश्रयः ॥

स पुमान् धार्मिकी लोके स क्रतार्थः सतुद्विमान् ।

सत्यगारीग्यशालायामौपद्यैः स्त्रेहपाचनैः ॥

man in this world. If in such a hospital the kind-hearted man can cure a single patient of his maladies by simple medicines, oleaginous remedies and compounds of medicinal decoctions, goes to the Brahma's residence with his seven generations upwards. The rich and the poor acquire religious merit in proportion to the amount of riches they possess ; where would the poor man get a hospital and a young physician to cure his diseases ? The man secures the eternal regions mentioned before by rendering the sick healthy by the use of roots to some and by good rubbing (with external applications) to others. He who cures the sick suffering from an increase or decrease of the Air, the Bile and the Phlegm by simple remedies, he too goes to such blessed regions (after death) as are secured by those who perform many religious sacrifices (Yajñas).

व्याधिनं विरुद्धी कृत्य अप्येकं करुणायुतः ।
 प्रयाति व्रज्ञसदनं कुलसमक्संयुतः ॥
 आश्ची विचानुसारेण दरिद्रः फलभाग् भवेत् ।
 दरिद्रस्य कुतः शाला आरोग्याय भिषग्युवा ॥
 अपिमूलेन केनापि मर्दनादैरथापि वा ।
 स्खस्थीकृते भवेन्मत्तेन पूर्वोक्तं लोकामव्ययं ॥
 वात-पित्त-कफाद्यानां चया-पचयभेदिनां ।
 यस्तु स्खस्थाभ्युपायेन मीचयेत् व्याधिपौडितान् ॥
 सीपि याति शुभान् लोकान् अवाप्यान् यज्ञयाजिभिः ।

स्कन्दपुराणे ।

आरोग्य शालां यः कुर्यात् महाबैद्यपुरस्कृतां ।
 सव्वोपकरणोपेतां तस्य पुण्यफलं शणु ॥
 धर्मा-र्थ-काम-मीचाणामारोग्यं साधनं यतः ।
 तम्मादारीग्य दानेन तद्दत्तं स्याच्चतुष्यं ॥
 अथैकमात्रं विदांसं स्खस्थीकृत्य प्रयत्नतः ।
 प्राप्नोति सुमहतम्पुण्यमनन्तं चयवर्जितं ॥
 ज्ञानयोगरतं शान्तं रोगात्मं शिवयोगिनं ।
 यः स्खस्थं कुरुते सीपि सर्वदानफलं लभेत् ॥

Skandapurāṇa.

Hear, the amount of religious merit secured by a man who erects a hospital containing all the necessary articles (of treatment) and in which are engaged eminent physicians by reward. As good health is the means of attaining religious merit, wealth, pleasure and final emancipation, therefore, he by rendering the sick healthy, gives these four blessings.

By carefully curing a learned man of his sickness great merit is secured, which is eternal and indestructible. He too who cures a sickman who is calm and absorbed in meditation of Siva and knowledge, attains the virtue of all kinds of gifts. Bramhā, Visnu, all the gods, diseases, relatives and kings—they are obstacles to yoga but not to those who perform it (yogi). Whatever merit is obtained by the great, by supporting the sick Brāhmans (priests), Kshatriyas (warriors), and Biṭh (cultivators) and Sudras (servants), can not be obtained by the performance of all the great Yajñas (religious ceremonics). As even the gods can not reach the end of the

ब्रह्मा विश्वः सुराः सर्वे व्याधयः सजना नृपाः ।
 योगयैते महाविश्वा व्याधयसे न योगिनां * ॥
 ब्रह्म-चत्रिय-विट्-शूद्रान् रोगाच्छान् परिपाल्य च ।
 यत्पुण्यं महदाप्नीति न तस्मैर्महामखैः ॥
 आकाशस्य यथा नातः सुरैरप्युपलभ्यते ।
 तद्दारीग्यदानस्य नालौबै विद्यते क्वचित् ॥
 पुण्येनानेन महता गत्वा शिवपुरं नरः ।
 मीदते विविधैभौगैर्विभानैः सर्वकामिकैः ।
 एकविंशत्कुलीपेतः सभृत्यः परिपालितः ।
 आस्ते शिवपुरे ज्ञावदावदाह्वतसंप्लवं ॥
 ततः स्वधर्मशेषेण संप्राप्तः प्रयतः सदा ।
 ज्ञानमुपद्रवते तस्म रुद्रेभ्यः परिचारकः ॥

* स्वेन योगिनामिति वा पाठः ।

firmament, so there is no end (to the merit) of the gift of cure. By this great merit, the man reaching the region of Siva enjoys himself by soaring in a balloon which can go to the various desired directions. With his twenty-one generations upwards and surrounded by his servants, he stays in the Siva's realm so long till deluge does not occur. There, after the lapse of his merit, the devoted servant acquires knowledge from Siva.

Abandoning this world by knowledge, abiding by the prayers to Siva, and casting away this body as a straw, he reaches beyond the limits of sorrow. Being freed from all sorrows, becoming pure, all-knowing and self-sufficient, and absorbed in his ownself, they are called the Liberated. Therefore to mitigate the diseases, the sick should be well nursed; the great sages should especially be attended to even by the sacrifice of one's body or riches. The wise must not irritate the weak patients, and they like the preceptors should be rescued constantly from sins. He who relieves the sick, by taking them under his care, reaches the other bank of this ocean of world.

ज्ञानादिरक्तः संसाराच्छिवधानमुपार्श्वितः ।
 सदैहूं लृणवत्तरात्रा सर्वदःखात्माप्नुयात् ॥
 समस्तदुःखनिर्मुक्तः शुद्धः स्नात्मव्यवस्थितः ।
 सर्वज्ञः परिपूर्णश्च मुक्त इत्यभिधीयते ॥
 तस्माज्ञीगापवर्गार्थं रीगार्त्तं समुपाचरेत् ।
 विशेषेण तु योगीन्द्रं श्रीरेण धनेन च ॥
 रीगिणी नीडिजेत् प्राज्ञी दुर्बलानपि सर्वदा ।
 तान् पापाह्नु रुवन्नित्यमेवन्धर्मः प्रवर्जते ॥
 यीत्यगहीतमात्मानं मन्यमानी दिने दिने ।
 उपसर्वेत रीगार्त्तस्त्रीर्णस्तेन भवार्णवः ॥

इत्यारोग्यदानं ।

After these proofs, the statement of Mr. Ameer Ali that "the Arabs invented chemical pharmacy, and were the founders of those institutions which are now called dispensaries"¹ can not be accepted as correct.

DISPENSARIES.

As regards dispensaries, Suśruta advises the physician to construct his dispensary in a clean locality; and the building should face towards some auspicious direction as the east or the north. He says:—"The medicines should be kept in burnt earthen pots arranged on planks supported by stakes or pins".² This is still the method of storing medicines used by the *Kavirājas*. Dallvāna explains the passage thus:—"The medicines should be kept in pieces of cloth, earthen pots, wooden pots and Śāṅku (kīlaka)."³ The former explanation is plausible for it is impossible to imagine how a kīlaka or stake can be a container of medicine, unless it is implied as a point of support for hanging the medicine vials from it.

Dr. Heyne (1814) thus describes the ancient dispensaries of the Hindus: "The place in which medicines are kept should

¹ History of the Saracens p. 262, 1899.

² स्त्रीतस्त्राण्डफलकशङ्कविन्यस्तमेषजं
प्रशस्तायां दिशि शुचौ भेषजागारमिष्यते ॥

Suśruta Saṁhitā. I. xxxvii.

³ गृहीतौषधसंस्थापनोपायं दर्शयन्नाह;—स्त्रीतेति । स्त्रीतः कर्पटखण्डं, सूदा भाण्डं, सृतभाण्डं । फलकं पट्टकं इति पुस्तकान्तरे पाठः, शङ्कः कीलकः, एतेषु स्त्रीतादिषु विन्यस्तं धृतं भेषजं यस्मिन् गृहे तत् भेषजागारं भेषजगृहमिष्यते इति सम्बन्धः । प्रशस्तायां दिशि पूर्वस्यामुत्तरस्यां वा, शुचौ दिशे अस्मिन् भूमिप्रविभागीयाद्यायी, निवस्येषु व्यत्ययेन न पाठी दृश्यते । अस्माभिस्तु वृडक्रमरीत्यैव पाठी लिखित इति सर्वावयवसायेष्वित्यादि यावत्त्रयं द्रव्यं पुराणञ्चेति पाठं केचिदाचार्या न पठन्ति ॥

Dallvāna's Commentary.

be clean, dry, and not accessible to rats, white ants or dust. The drugs ought to be put in nets, or large pots, the mouth of which must be tied over with a piece of cloth, and suspended in a room. Fire, smoke and water must be kept at a distance.

The house in which medicines are stored, should be neither in too high nor too low a situation, and it should not be far distant from places in which medicines may be collected. Its front should face either the south or the north, with a convenient *viranda* before the door of the same side.

The necessary apparatus for mortars, scales, &c., must be kept in a place in the wall that has been consecrated for that purpose by religious ceremonies."

After describing the different classes, and members composing each class, of medicines, Suśruta continues: "The wise physician should collect and classify these medicines, and with them prepare external applications, infusions, oils, ghee, syrups, &c., as required for derangement of a particular humour. The medicines should be carefully preserved in all seasons, in rooms free from smoke, rain, wind and dust. The medicines should be used singly, or in combinations of several medicines of a class, or of an entire group, or of more than one group, according to the nature of the disease, and the extent of derangement of the humours."¹

¹ एभिर्लोपान् कषायांश्च तैलं सर्पीं षिपानकान् ।
प्रविभज्य यथान्वयं कुर्व्वति मतिमान् भिषक् ॥
धूमवर्षानिलक्षेदैः सर्वचुष्वनभिद्गुते ।
ग्राहयिला गटहे न्यस्येविधिनौषधसंग्रहं ॥
समौत्त्व्य दीषभेदाश्च गणान् भिन्नान् प्रयोजयेत् ।
पृथग्भिश्चाण् समस्तान् वा गच्छं वा व्यस्तसहतं ॥

ANÆSTHETICS.

In the medical text books of the Hindus, there is no mention of a general anæsthetic, from which we can infer that it was unknown in those ancient days. There are, however, many indications to show that the earlier surgeons felt the necessity of such an agent to produce insensibility to pain. Both Caraka and Suśruta mention the use of wine to produce the desired effect. Caraka says: "After extraction of a dead fœtus before the full term of pregnancy, wine should be prescribed to her, for that will improve the condition of her uterus, make her happy and alleviate the pain of the operation."¹ Suśruta, however, distinctly lays down that "wine should be used before operation to produce insensibility to pain." He again remarks: "It is desirable that the patient should be fed before being operated on. Those who are addicted to drink and those who cannot bear pain, should be made to drink some strong beverage. The patient, who has been fed, does not faint, and he who is rendered intoxicated, does not feel the pain of the operation."²

The use of certain drugs to produce anæsthetic effects was well known to the ancient Greeks and Romans. Dioscorides

¹ व्यपगतगर्भश्ल्यान्तु स्त्रियमासगर्भे सुराशौधनरिष्टमधुमदिरासवानामन्यतमसये
सामर्थ्येतः पाययेत गर्भकीष्विगुह्यर्थमर्त्तिविमरणाद्र्यं प्रहर्षस्थार्थच ॥

Caraka Saṁhitā, IV, viii.

² प्राक्शस्तकर्मणशेषं भीजयेदातुरं भिषक् ।

मदापं पाययेन्मदं तौक्ष्यं योऽवेदनासहः ॥

न मूर्च्छलब्धसंयोगान्मत्तः शस्त्रं न बुध्यते ।

तस्मादवश्यं भीक्षत्वं रीतेषु त्वं कर्मनि ॥

प्राणी ज्ञान्यन्तरी नृणां वाह्यप्राणगुणान्वितः ।

धारयत्विरीघेन शरीरं पात्रभौतिकं ॥

Suśruta Saṁhitā, I, xvii.

mentions Mandragora (Mandragora Atropa) to have been employed internally as a hypnotic and anæsthetic. Pliny (32-79 A.D.) in his Natural History mentions that this anæsthetic was also used by inhalation; and this fact is corroborated by Galen, Arætæus, Celsus and others. The Arabian physicians also used it. The Chinese surgeons still use some powder (Indian hemp probably) to throw their patients into profound sleep. In the 13th century Theodoric (died 1298) described the "spongio somnifera" the vapours raised from which were capable, when inhaled, of setting patients into an anæsthetic sleep, thus inducing insensibility to the agony and torture of a surgeon's knife. Baptista also mentions his "Pomum somniferum", to be made with mandragora, opium, &c. The Hindus also inhaled the fumes of burning Indian hemp as an anaesthetic at a period of great antiquity. As early as 927, A. D., they also knew drugs which they employed for the same purpose, for Pandit Vallala, in his Bhoja Prabandha, alludes to a cranial operation performed on the King Bhoja after he was rendered insensible by some drug called Sammohini (producer of unconsciousness). Another drug is also mentioned, Sañjibani (restorer to life), by which he soon regained consciousness after the operation had been finished.¹

¹ तत्सावपि राजानं मोहचूर्णेन मोहयित्वा शिरःकपालमादाय तत्करोटिकापुटे स्थितं शफरकुलं गृहीत्वा कम्भिश्चिह्नाजने निचिष्प्य सञ्चानकरण्या कपालं यथावदारच्य सज्जीवन्ना च तं जीवयित्वा तस्मै तद्वश्यताम् ।

CHAPTER III.

MATERIALS OF INSTRUMENTS.

IRON AND STEEL.

In the R̄gveda, *ayas*, (Latin *aes*), next to gold, is the metal most often referred to. *Ayas* often stands as a generic name to mean simply "metal," though in later works it signifies iron as a rule. The mention of dark and red *ayas* in the Atharva-veda indicates a distinction between iron and copper or bronze. The surgical instruments of the Hindus are recommended generally to be made of iron; but Suśruta allows other suitable material when iron of good quality is not available.¹ He says: "A wise surgeon should get the instruments made of pure iron and with sharp edges by an expert blacksmith who is skilful and experienced in his craft."² The use of impure iron as a material for surgical instruments, he deprecates as a defect and advises the surgeons not to rely on such instruments.

The Hindus were acquainted with steel and they knew how to turn out steel of fine quality from a pure iron ore. Nāgārjuna, the well known Buddhist chemist, wrote a scientific

¹ तानि प्रायश्ची लौहानि भवन्ति तत्प्रतिष्ठपकाणि वा तदलाभे ।

Suśruta Samhitā. I. vii.

² शस्त्राखेतानि मतिमान् शुद्धशैक्यायसानि तु ।
कारयेत् करणैः प्राप्तं कर्मारं कर्मकीविदं ॥

Ibid., I. viii.

treatise on steel and iron.¹ Śibodāsa in his commentary on Chakrapāṇi quotes Patañjali as an authority on the subject.² In the Dhanurveda, Vīracintāmaṇi, Śāraṅgadharapaddhati and Lohārnava, steel as a material of sword has been described and classified.

Dr. Mitra quotes some references³ about the knowledge of iron possessed by the ancient Hindus from the R̄gveda. He finds that “swords (II. 156), spears (IV. 25), javelins (II. 292), lances (I. 774), (IV. II. 288) and hatchets (I. 120) are frequently mentioned ; and these weapons were bright as “gold” or golden (IV. 19), “shining bright” (I. 175), “blazing” (IV. 93), “sharp” (IV. 113) and “made of iron” (I. 226) ; they are “whetted on a grind stone (II. 36) to improve their keenness (I. 150), and “polished to enhance their brightness” (II. 326).....“According to Nearchus, King Porus gave 30 lbs of steel to Alexander as the most precious present he could offer.”

Royle also remarks⁴ : “Working in metals they have long been famous for: their steel acquired so great celebrity at an

¹ नागार्जुनो मुनीन्द्र शशास यज्ञोहशास्त्रमतिगहनम् ।
तस्यार्थस्य चृतये वयमेतदिशदाचरैर्वृमः ॥

Cakradatta, Rasāyanādhikāra.

² अर्चयिता विधानेन हेरम्बं गुरुभास्तरौ ।
लीकपालान् यहांशैव चेत्पालानयौषधम् ।
आदित्यदेवताशेषा धन्वन्तरौ-पतञ्जली
दद्यादलिङ्ग सर्वेभ्यो नानाभचीपचारतः ॥

Quoted in Śibodas's commentary on Louhamārana-Vidhi in Cakradatta.

³ Dr. R. L. Mitra's Indo-Aryans, Vol. 1, P. 301. See Wilson's R̄gveda,

⁴ Royle's Antiquity of Hindoo Medicine. Pp. 46-7.

early period, as to have passed into a proverb among the Persians, where *fouladee hind* indicates steel of the best quality; and *juwabee hind*, an Indian answer, means a cut with a sword made of Indian steel."

COPPER.

Pure copper was also used as a material of instruments; and vessels and instruments of copper are frequently mentioned in the medical books of the Hindus. A copper probe for applying antimony to the eye has been found in the excavations of Bijnor and another in the Bihat excavations. Cakradatta¹ advises us to use a copper probe for the application of *lekhana* collyrium; and Suśruta mentions a copper needle in the operation for re-clination of cataract.²

TIN.

Tin was also used as a material of blunt instruments. Suśruta mentions plates of tin to surround a tumour and to protect the healthy parts, before the application of actual cautery.³ Such plates are recommended to be made of tin, or lead, or copper, or iron.

LEAD.

Tubes of lead were used for purpose of fumigation. Probes made of lead were used for application of collyrium. The use

¹ प्रशस्ता लेखने तासी रोपने कालकीहजा ।

Cakradatta, Añjanadhikāra.

² ताम्रायसी शातकौमी श्लाका स्यादनिन्दिता ।

Suśruta Samhitā, VI. xvii.

³ अल्पावशिष्टे कृमिभिः कृते च लिखेत्ततोऽग्निं विदधीत पशात् ।

यदल्पमूलं वपुतामसीस पट्टे समावेष्य तदायसेव्वा ।

चाराग्निश्लाख सक्रदविदध्यात् प्रानाणहिंसनं भिषग्प्रमत्तः ॥

Suśruta Samhitā, IV. xviii.

of lead plates to surround tumours before application of actual cautery has been noted above.

BELL-METAL.

The use of bell-metal—an amalgam of zinc or tin and copper, 25 parts of the former with 75 parts of the latter,—as a material of probes for applying collyrium, is mentioned by Suśruta.¹

GOLD AND SILVER.

Gold was known to the Hindus from the remote antiquity; and among the metals, it is the one most frequently² mentioned in the R̄gveda. Silver was perhaps unknown during the earlier Vedic age, from its name being not mentioned in the R̄gveda. But no conclusion can safely be drawn from this argument³. We find, however, gold, silver, and other precious

¹ सौवर्णं राजतं शार्ङ्गनाम् वैदूर्यकांसरजं

आयसानि च यीज्यानि श्लाकाश्च यथाक्रमं ॥

Suśruta Samhitā, VI. xviii.

² “निष्ठ यौव”

R̄gveda. 5 Mandala. 19 Sūkta.

“निष्ठेन सुवर्णे न अलङ्घता यौवा” ।

Sāyana.

अश्वः न हेत्यावान् ।

Ibid. 4 Mandala. 2 Sūkta.

“सुवर्णं निर्मित कल्यावान् अश्वः” ।

Sāyana.

“A horse with golden caparisons”—Wilson.

³ “एनौं रथिं” ।

R̄gveda. 5 Mandala. 33 Sūkta.

एनवर्णो श्वेतवर्णो रथिं धनं ।

Sāyana.

“Query, if silver money be intended”—Wilson.

stones mentioned as materials of instruments in the medical books. Gold and silver vessels and plates are often described in Sanskrit literature.¹ Suśruta mentions the use of drinking cups made of gold, silver and precious stones.²

Caraka, amongst other things necessary for a lying-in-room, mentions two needles of gold and silver.³ To cut the navel-cord of the new-born child, he recommends a knife made of gold, or silver, or iron.⁴ In the Manusamhitā⁵ we find : "Before the section of the navel string, a ceremony is ordained on the birth of a male; he must be made while sacred texts are pronounced, to taste a little honey and clarified butter from a golden spoon."⁶ A golden needle is mentioned by

¹ सूवर्णदृप्यशङ्काश्च शुक्रिं रत्नं मयानि च ।
कांस्याय स्तानं रैत्यानि एपुसीस मयानि च ।
निलेपानि विशुद्धनिं कैवल्येन जलेन तु ॥

इति व्राचे ।

² सौवर्णे राजते तामे कांसे र मणिमये तथा
पुष्पावतंसं भौमे वा सुगम्भि सलिलं पिवेत् ॥

Suśruta Samhitā, I. xlv.

³ * * * तीक्ष्णौ सूचीपिपलकौ सौवर्णराजतौ हे शस्त्राणि च तीक्ष्णायसानि ।

Caraka Samhitā, IV. viii.

⁴ नाभिवधनात् प्रभृति हित्वा आङ्गुलमभिज्ञानं क्षत्वा क्षेदनावकाशस्त्र इयोवन्तरयोः
ग्रन्थेर्ट हीत्वा तीक्ष्णेन रौकराजतायसाना क्षेदनानामन्यतमेनोद्धारेन क्षेदयेत् ॥

Ibid.

⁵ प्राड् नाभिवधनात्युंसी जातकर्म विधीयते ।
मन्त्रवत्राशनं चास्त्र हिरण्यमधुसर्पिषाम् ॥

Manusamhitā, II. 29.

⁶ Manusamhitā (ch. II. V. 29. Jones's trans.)

Suśruta for pricking the bulb of Soma plant to extract its juice.¹ To cure trichiasis, Cakradatta mentions a needle cautery of gold.² For destroying the hair follicles, he advises us to pass the hot needle into them as soon as the eyelashes are removed by epilation. In the Yogaratnākara, is mentioned a cautery of gold, to burn the fistulous track round the anus.³ Śāringadhara mentions silver or coral pots for keeping medicated snuffs,⁴ and gold and silver tubs for immersing patients in medicated lotions.⁵

HORN.

Horns of animals are mentioned as suction-apparatus. For

¹ * * * * सोमकन्दं सुवर्णसूचादिविदार्थं पयीगल्लीयात् सौवर्णं पत्रेऽज्जलिमात्रं * * * *

Suśruta Saṃhitā, IV. xxix.

² प्रवङ्गान्तर्मुखं रोम सहिष्णीरुद्धरक्ष्यनैः।
सन्दर्शनोद्धरेद्यथां पच्चरोमाणि बुद्धिमान्।
रक्तवृक्षि दहेत् पच्च तपहेमशलाकया।
पच्चरोगे पुननैव कदाचिद्दोषसम्भवः॥

Cakradatta. Netraroga Cikitsā.

³ अपानमार्गपिटिकां दहेत् स्वर्णशलाकया।
अग्निप्रतपथा पश्चात् कुर्यादग्निव्रणक्रियाम्॥

Yogaratnākara, p. 347.
(Anandāśram Series).

⁴ कीणमच्छन्नधारत्वं हेमतारादिशुक्तिभिः।
शुक्र्या वा पात्रे युक्त्या वा म्लातैर्वा नस्यमाचरेत्॥

Śāringadhara Saṃgraha, III. viii.

⁵ सौवर्णं राजतं वापि ताम्भायसञ्चाराहजं।
क्वाप्तं तत्र कुब्बीतीक्ष्याये पठत्विंशदङ्गुलं॥

Ibid, III. ii.

this purpose, the horn of a cow is recommended.¹ A probe made of horn is advised to be used for applying collyrium. Suśruta mentions goat's horn to be used as a container of medicine.² He also recommends for this purpose vessels manufactured out of horn.³ Similarly Caraka advises us to keep medicines in the lamb's horn.⁴ Tubes of Vasti-yantra (clysters) are often described to be made of horn.⁵

BONE AND IVORY.

Vāgbhaṭa II describes the aṅguli-trāṇaka or finger-guard to be made either of wood or ivory.⁶

¹ “चुषणे”, विष पूयाद्या चूषण निमित्तं शरीरेषु युज्यते यत्, “शङ्खः” गवादि भवं शुषिर् शङ्खः * * * *

Vāgbhatārtha Kaumudī, I. xxv.

² चुर्णञ्जनं कारयित्वा भाजने मेषशङ्खञ्जे ॥

संस्थाप्यभयतः कालसञ्जयेत् सततं बुधः ।

Suśruta Saṃhitā, VI. xv.

वंशे वा माहिषे शङ्खे स्थापयेत् शोधितं रसम् ।

Rasendra Cintāmaṇi, IX.

³ एतच्चूर्णञ्जनं श्रेष्ठं निहितं भाजने शुभे ।

दन्तस्फटिकवैदूर्यं शङ्खशैलासनोङ्गवे ।

शातकुम्भेऽथ शङ्खं वा राजते वा सुसंस्कृते ॥

Suśruta Saṃhitā, VI. xix.

⁴ सिद्धः शैलासने भाण्डे मेषशङ्खे च संस्थितः ॥

Caraka Saṃhitā, VI. xxvi.

⁵ विमुद्रासं विखण्डात्र धातुजां काषजां तथा ।

षड्ङुलीस्थां गोपुक्षां नाडीं युज्जगात् दिव्यस्तिकां ॥

Sārṅgadharā Saṃgraha, III. ii.

⁶ अङ्गुलि ताणकं दान्तं वार्चं वा चतुराङ्गुलं ।

Aṣṭāṅga Hṛdaya. I. XXV.

WOOD.

To apply vapour-bath, Śāringadhara mentions tubes made of wood or metal.¹ Wooden Tubes for injections were also used.²

STONE.

Śāringadhara says: "The collyrium probes should be made either of stone or metal".³ For compounding medicines, stone *khal* or mortar and pestles are mentioned. A big stone slab with a muller is recommended to be used for grinding dry or fresh vegetable medicines. In extracting the Soma juice, two slabs of stone are mentioned in the Rgveda.⁴

EXECUTION.

The execution of the instruments is said to have been all that can be desired. Suśruta says⁵: "They should be made just of the proper size with their ends rough or polished ; they should be also strong, well-shaped and capable of a firm grasp." Again he continues : "When an instrument (has been selected) of

¹ नेत्रानि धातुजान्याहुर्नलं वंशादिजान्यपि ॥

Śāringadhara Samgraha, III. ix.

² नेत्रं कार्थं सुवर्णदिधातुभिहृचवेणुभिः ।

नलैर्द्वयैविषाणायैः मणिभिर्या विधीयते ॥

Ibid, III. v.

³ सुखयोः कुण्ठिता श्वस्मा श्लाकाष्ठाङ्गुलोन्मिता ।

अग्नमजा धातुजा वा स्यात् कलायपरिमण्डला ॥

Ibid, III. xiii.

⁴ Rgveda. 10 Mandala, 76, 94 & 175 Sūktas.

⁵ समाहितानि यन्त्राणि खरश्चमसुखानि च ।

सुट्टानि सुरूपाणि सुग्रहाणि च कारयेत् ॥

Suśruta Saṃhitā, I. vii.

a fine make and with an edge keen enough to divide the hairs on the skin, and when it has been firmly grasped at the proper place, only then it should be used in any surgical operation"¹. And again : "A wise surgeon will get his instruments made of good iron and with sharp edges, by a blacksmith who is skilful and experienced in his craft."² Vāgbhaṭa also gives the same directions.³

ORNAMENTATION.

In the absence of actual specimen, it is impossible to say whether there was any ornamentation on the surgical instruments of the Hindus. No ornamentation is described in the extant medical treatises. Only one instrument—Mucutī—is mentioned by Vāgbhaṭa II as being ornamented with a ring.⁴

EDGES OF SHARP INSTRUMENTS.

Suśruta says⁵ : "The edges of instruments, used in incising

¹ यदा सुनिश्चितं शस्त्रं रोमच्छेदि सुसंस्थितं ।

सुगटहीतं प्रमाणेन तदा कर्मसु योजयेत् ॥

Ibid., I. viii.

² See foot-note 2, P. 61.

³ षड् विंशतिः सुकर्मारैर्धटितानि यथाविधिः ।
शस्त्राणि रोमवाहीनि वाहूल्येनाङ्गुलानि षट् ॥
सुरुपाणि सुधाराणि सुग्रहाणि च कारयेत् ।
अकरालानि सुभातसुतीक्ष्णावार्चतेऽयसि ॥
समाहितसुखाग्राणि नीलाभोजच्छवीनि च ।
नामानुगतरूपाणि सदा सन्निहितानि च ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ सुचुटी सूच्च दन्तं गुर्मूले रुचकाभूषणा ।

Ibid.

⁵ तत्रधारा भेदनानां मासूरी । लेखनानामर्द्दमासूरी ।

व्यधनानां विस्वावणानाम् कैश्कौति । क्वेदनानामर्द्दकैश्कौति ॥

Suśruta Saṃhitā, I. viii.

(as of Vṛddhipatra, Nakhaśastra, &c.) should be of the fineness of a masūra (Ervum Lens); of those used in scarifying (as Māndalāgra &c.) of a half a masūra; of those used in puncturing (as Kuṭhārikā) and evacuating (as needles, kuśapatra, &c.) of a hair; and those used in dividing (as Vṛddhipatra), of half a hair". As to the Vadiṣa or hook and the Dantaśaṅku or tooth-scalers, the former should have a curved end and a fine point, while the latter should have an end shaped like the first leaf of barley."¹

THE TEMPERING OF SHARP INSTRUMENTS.

Suśruta remarks² that "the instruments are tempered in three ways;—by immersing the heated śastra in an alkaline solution, or water, or oil. Those tempered in an alkaline solution are used in dividing bones and in excising arrows and other foreign bodies. Those tempered in water are used in incising, dividing or clearing muscles; and those tempered in oil are used in puncturing veins and dividing nerves and tendons."

As the methods of tempering the śastras are the same as those recommended for the arms of war, we quote from Vṛddha Śārangadhara (the elder), two methods of tempering arrow-heads and swords. He says³: "I shall describe the ways of tempering arrow-heads, by smearing them with a paste of

¹ वडिशो दन्तशङ्कुशानतागे तौच्छकरण्टकप्रथम यवपतसुखे ।

Suśruta Saṁhitā, I. viii.

² तेषां पायना चिविधा चारीदक्तैलेषु तत्र ज्ञारपायितं शरश्लग्रास्थिच्छेदनेषु । उदकपायितम् मांसच्छेदनभेदनपाठनेषु तैलपायितं सिराव्यधनस्तायुच्छेदनेषु ।

Ibid.

³ फलसर्प पायनं वक्ष्ये वनौषधिर्विलेपनैः ।

येन दुर्भेद्यवर्माणि भेदयेत् तत्पर्णवत् ॥

Vṛddhyā Śārangadhara,

vegetable drugs, which would thus acquire the power of piercing a coat-of-mail as easily as the leaf of a tree."

I.

"Make a paste of Pippalī (Piper Longum), rock-salt and Kuṣṭha (Saussurea Lappa) with cow's urine. These are to be well mixed until the paste becomes cold and yellow. The arrow-heads and other sharp cutting instruments are to be well smeared, with that paste and then heated to redness. Then they are to be removed from the furnace and allowed to cool down to a state short of redness and dipped in oil. By this means, the iron acquires special power as a cutting instrument¹".

II.

"Make a paste of the five kinds of salts,² mustard and honey. Let the instrument-maker smear it on the śastras which are then to be heated in a furnace. When the colours resembling those of a peacock's feather are displayed on the śashtra, the burning is known to be adequate. The instrument is then dipped in water³".

¹ पिष्टली सैखवं कुठं गोमूत्रैन तु पेषयेत् ।
अतिश्रीत मनाविङ्गं पीतं न तथौषधम् ॥
अनेन लेपयैच्छस्त्रं लिप्तं चाग्नौ प्रतापयेत् ।
ततो निर्बापितं तैले लौहं तत्र विशिष्टते ॥

Vṛddhya Śāringadhara.

² सौर्वर्चलं सैखवञ्च विडमौङ्गिदमेव च ।
सामुद्रेन सहैतानि पञ्चसुर्लवणानि च ॥

Vaidyaka.

³ पञ्चभिर्लवणैः पिण्डं मधुसिक्तः ससर्षपैः ।
एभिः प्रलेपयैच्छस्त्रं लिप्तं चाग्नौ प्रतापयेत् ॥
शिखियौवानुवर्णाभं तप्तपीतं तथौषधं ।
ततस्तु विमलं तीयं पाययैच्छस्त्रमुत्तमम् ॥

Vṛddhya Śāringadhara.

III.

The sage Uṣanās or Śukrācāryya thus describes¹ the tempering of swords in the Vṛhat Saṁhitā (Kern's trans. Ch. L.) :—

23. The fluid to imbrue a sword with, according to the precepts of Uṣanās, is: blood, if one wishes for a splendid fortune; ghee, if one is desirous to have a virtuous son; water, if one is longing for inexhaustible wealth.

24. An approved mixture to imbrue the sword with, in case of one desirous to attain his object by wicked means, is: milk from a mare, a camel and an elephant. A mixture of fish bile, deer-milk, horse-milk, and goat-milk, blended with toddy, will make the sword fit to cut an elephant's trunk.

25. A sword first rubbed with oil, and then imbrued with an unguent compounded of the milky juice of the Calotropis, goat's horn, ink, dung from doves and mice, and afterwards whetted, is fit for piercing stone.

¹ वङ्गवीष्टकरेणुग्धपानं
यदिपानेन समीहतेऽर्थसिद्धिं ।
भषपिण्डमृगाश्च वस्तुदृच्छैः
करिहस्तच्छदये सतालगभैः ॥
आर्कं पयो हुङ् विषाणमसौसमेत
पारवतास्तु शक्ता च युते प्रलेपः ।
शस्त्रस्य तैलमथितस्य ततीऽस्य पानं
पश्चाच्छितस्य न शिलासु भवेदिधातः ॥
क्षारे कदल्या मधितेन युक्ते
दिनोषिते पायितमायसं यत् ।
सम्यक् शितं धाश्मनि नैति भङ्गं
न चान्यस्तौहेष्वपि तस्य कौण्ठाम् ॥

26. An instrument imbrued with a stale mixture of potash of plantains with butter milk, and properly whetted, will not get crooked on a stone, nor blunted on other iron instruments.

GOOD AND BAD QUALITIES OF SURGICAL INSTRUMENTS.

Suśruta says¹: "The good points in an instrument are the following : it should have a well-made handle, affording a firm grasp ; it should be made of iron of good quality ; it should have a fine edge, a pleasant shape and a well-finished point ; and it should not be dentated (except the saw)." He gives preference to the Śastras which are of good make and with a fine edge—so fine as to divide the hairs on the skin and whose handles can easily be grasped by the surgeon's hand.

On the other hand, he points out eight defects² of sharp instruments : they must not be bent, or blunt, or broken, or jagged, or too thick, or too thin, or too long, or too short. Instruments free from these defects should be used. The Karapatra or saw is the only exception, for being used for sawing bones, it requires a jagged or dentated edge. Vāgbhaṭa also mentions these defects.³

¹ तानि सुग्रहाणि सुलोहाणि सुधारानि सुरूपाणि सुसमाहितमुखायस्यकरालानि चेति शस्त्रसम्पत् ।

Suśruta Saṃhitā, I. viii.

² तद वक्रं कुण्डं खरण्डं खरधारं मतिस्थूलमत्यल्पमतिदीर्घमतिक्षमित्यष्टौ शस्त्रदीपाः । अतो विपरीतगुणमाददीतान्यव करपत्रात्तद्वि खरधारमस्थिक्षेदनार्थं ।

Ibid.

³ कुण्ड-खरण्ड-तनु-स्थूल-क्रस्त-दीर्घल-वक्रताः ।

शस्त्राणं खरधारलमष्टौ दीपाः प्रकौर्त्तिताः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

Suśruta enumerates twelve defects¹ of blunt instruments, viz.; it may be too thick, or made of impure metal, or too long, or too short, or incapable of being grasped, or capable of being grasped (unevenly) partially, or bent, or made of too soft material, or of elevated ends, or it may have bent, loose, elevated, and weak pins, or be of weak ends, or of thin sides. These faults refer principally to the *Swastika yantras* or the cruciform instruments.

THE USES OF INSTRUMENTS.

Twenty four different kinds of operations² are said to be performed by the blunt instruments (Suśruta), viz.:—

- | | |
|-----------------|--|
| 1. Nirghātana | ... Extraction by moving to and
fro. e. g. śalyanirghātanī. |
| 2. Pūraṇa ... | ... Filling the bladder or eyes
with oil. |
| 3. Bandhana ... | ... Bandaging and binding by rope. |
| 4. Vyūhana ... | ... 1. Raising up and incising a
part for removing a thorn
or 2. bringing together the
lips of the wound. |
| 5. Vartana ... | ... Contracting or curling up. |

¹ तच्चातिस्थूलमसारमतिदीर्घमतिक्रस्यमयाहिविषमयाहि वक्रं शिथिलमत्युन्नतं मृदुकौलं
मृदुमुखं मृदुपाशमिति इटश्य यन्वदीषाः।

Suśruta Saṁhitā, I. vii.

² यन्वकर्मानितु निर्धातनपूरणवस्त्रनव्यहृनवर्त्तनचालनविवर्त्तनविवरणपौड़नमार्ग-
विश्रीधनविकर्षणाहरणात्मनीद्रमनविनमनभज्जनीमध्यनाचूषणैषणदारणर्जूकरणप्रचालनप्रधमन-
प्रमार्जनानि चतुर्विंशतिः।

Ibid.

6. Cālana ...	... 1. transferring, i.e., removing from one part to another; 2. moving a foreign body.
7. Vivartana	... Turning round.
8. Vavarāṇa	... Exposing or opening out any part.
9. Pīḍana ...	... Pressing as by finger to let out pus from an abscess.
10. Mārga Viśodhana	... Clearing the canals such as the urethra, rectum &c.
11. Vikarsaṇa	... 1. Extraction by pulling; or 2. loosening a foreign body fixed in muscles &c.
12. Āharaṇa ...	... Pulling out.
13. Āñcana ...	... Pulling up.
14. Unnamana	... Elevating or setting upright as the depressed cranial bones or ears.
15. Vinamana	... Depression as of the elevated ends of the fractured bone.
16. Bhañjana	... 1. Rubbing the head, ears &c.; 2. contusing a part all round before it is surgically operated on.
17. Unmathana	... Probing or stirring the track formed by an impacted foreign body.
18. Ācuṣaṇa	... Suction as of poisoned blood and milk by horns, or gourd, or mouth,

19. Eṣāṇa ... Exploring as by an earth-worm shaped probe, the direction of a sinus or the existence of a foreign body in the wound.
20. Dārana ... Splitting or dividing as the head, ears &c.
21. Rjukaraṇa ... Straightening anything which is bent.
22. Prakṣālana ... Washing as a wound with water.
23. Pradhamana ... Blowing as powders into the nose through tubes.
24. Pramārjana ... Rubbing out as foreign bodies from the eyes &c.

Vāgbhaṭa recognises only fifteen different kinds¹ of operations performed by the blunt instruments: Nirghātana (moving to and fro), Unmathana (probing), Pūraṇa (filling up), Mārga Śuddhi (clearing passages), Saṁvyūhana (raising up and extracting a thorn by incision), Āharana (pulling out), Bandhana (bandaging), Piḍana (pressing), Ācūṣāṇa (suction), Unnamana (elevation), Nāmana (depression), Cāla (movement), Bhaṅga (breaking), Vyāvartana (turning round); and Rjukaraṇa (straightening).

¹ निर्घातनौन्मथन पूरण मार्गशुद्धि
संव्युहनाहरण वस्त्रन पीडनानि ।
आचषणोत्तमन नामन चाल भङ्ग
व्यावर्तनजूकरणानि च यन्त्रकर्म ॥

The śastras or cutting instruments, on the other hand, are said to perform eight kinds of surgical operations (Suśruta).¹

- | | |
|----------------|---|
| 1. Chedana ... | ... Excision or removal of a part
of the body by operation as
of piles. ... |
|----------------|---|

Instruments :—Vṛddhipatra, nakhaśastra, mudrikā, utpalapatra, and arddhadhāra.

- | | |
|----------------|--|
| 2. Bhedana ... | ... Incision of a part, as of an
abscess. ... |
|----------------|--|

Instruments :—The same as above.

- | | |
|----------------|---|
| 3. Lekhana ... | ... Scarification or dissection of a
skin-flap; or scraping, as of
Rohini i.e., surgical diseases
of the throat. |
|----------------|---|

Instruments :—Mandalāgra and karapatra.

- | | |
|---------------------------|---|
| 4. Vedana or Vyādhana ... | Puncturing as of veins to bleed
patients by instruments
having fine points. |
|---------------------------|---|

Instruments :—Kuṭhārikā, vrīhimukha, ārā, vetaspatra,
and sūcī.

- | | |
|--------------|---|
| 5. Eṣana ... | ... Probing, as of sinus and fistula
by a probe. |
|--------------|---|

Instruments :—Eṣanī.

- | | |
|-----------------|--|
| 6. Āharana. ... | ... Extraction, as of stone by the
spoon or hook. |
|-----------------|--|

Instruments :—Vadīsa, and danta-śaiku.

¹ सच शास्त्रकम्माऽस्तविधं। तदथा। क्वैयं भेदं लिखं विध्यमेष्यमाहार्थं विस्ताव्यं
सीव्यन्ति।

7. Viśrāvāna ... To let out pus as from a deep-seated abscess.

Instruments :—Sūci, kuśapatra, ātīmukha, śarārimukha, antarmukha, trikurccaka, and eṣanī.

8. Sivana ... Stitching, as of the lips of a wound by needles.

Instruments :—The different kinds of sūci or needles.

Caraka mentions, however, six kinds¹ of operations :—

1. Pātana ... Incision, as in operation for sinus, abscess, intestinal injury, and deeply impacted foreign bodies.

2. Vyādhana ... Tapping or piercing, as in operations for ascites, suppurating tumour, ovarian tumour, boils &c.

¹ पाटनं व्यधनञ्चैव क्षेदनं लिपनं तथा ।
प्रीक्ष्णनं सीवनञ्चैव षड्विधं शस्त्रकर्म तत् ॥
नाडीत्रणाः पक्षशीयास्थाचतगुदीदरम् ।
अन्तःशल्याश ये देशाः पात्यास्ते तदिधाश ये ॥
दक्षोदराणि संपक्ता गुल्माः ये ये च रक्तजाः ।
व्याघाः श्रीणितरोगाश वीसर्पिङ्कादयः ॥
उद्वचान् स्थूलपर्यन्तानुत्सन्नान् कठिनान् त्रणान् ।
आर्णः प्रभृत्यधीमांसं क्षेदनेनीपपादयेत् ॥
किलासानि सुकुष्ठानि लिखेष्वेत्यानि बुद्धिमान् ॥
वातास्तुग्रथ्यिपिङ्काः सकीढा रक्तमरुलाः ।
कृष्णभिहितञ्चाङ्गं श्रीथांश्च प्रच्छयेद्विष्पक् ॥
सीव्यं कुचुग्रदरायन्तु गम्भीरं यहिपाटितं ।
इति षड्विधमुद्दिष्टं शस्त्रकर्म मनौषिभिः ॥

3. Chédana ... Excision, as in the operation for tumours, raised and thickened *vraṇo* or corns, and piles.
4. Lekhana ... Scraping, as in operation for some varieties of skin diseases.
5. Pracchana ... Scarifying, as in the operations for glands, boils, leprous nodules, inflammatory swellings, &c.
6. Sībana ... Sewing, as in the operation of laparotomy for deep seated diseases in the abdomen.

Vāgbhaṭa describes thirteen kinds¹ of operations performed by the sharp instruments :—

1. Utpātana ... Raising up by incision, as by the Nakhaśastra.
2. Pātana ... Incision as by the Vṛddhipatra.
3. Sīvana ... Stitching as by the Sūci.
4. Eṣaṇa ... Probing as by the Eṣanī.
5. Lekhana ... Scraping as by the Maṇḍalāgra.
6. Pracchana ... Scarification as by the Maṇḍalāgra.
7. Kuttana ... Pricking as by the Sūci in tattooing.
8. Chedana ... Excision as by the Vṛddhipatra.

¹ उत्पाद्य पाद्य सौवैय-लेख्य-प्रक्षम्न कुट्टनम् ।

क्षेयं भेदं व्यधी मशी यही दाहश तत्क्रियाः ॥

- | | |
|--------------|-------------------------------------|
| 9. Bhedana | ... Piercing as by the Sharp Eṣāṇī. |
| 10. Vyadhana | ... Tapping as by the Vetasapatra. |
| 11. Manthana | ... Churning as by the Khaja. |
| 12. Grahaṇa | ... Fixing as by the Sandamśa. |
| 13. Dahana | ... Burning as by the rods. |

WHETSTONE.

In the R̄gveda we find the use of stones mentioned for whetting the edges of the arms of war.¹ The Hindu surgeons used a stone slab for sharpening the śastras or edged instruments.² It was of the colour of māṣa (Phaseolus Roxb.). The whetstones used by the Greeks and Romans were either the marble ointment slabs, or made of clay slate or sandy schistaceous shale.

INSTRUMENT CASES.

To preserve the edges of the cutting instruments, a case made of the wood of śalmālī (Bombax Malabaricum) was used (Suśruta).³ Such cases were also manufactured of canvas, or wool, or silk, or leather. These cases—twelve *aṅguli* (*i.e.*, fingers' breadth) long and nine *aṅguli* broad—were well sewn and

¹ See R̄gveda, Mandala. 2 Sūkta. 39 Verse 7.

„ 9 „ 90 „ 1.

„ 9 „ 112 „ 2.

„ 10 „ 53 „ 9.

„ 19 „ 101 „ 2.

² तेषां निश्चानार्थं शूच्मशिला माषवर्णा ।

Suśruta Saṁhitā, I. viii.

³ धारस्स्यापनार्थं श्राव्यली फलकमिति ।

Ibid.

consisted of compartments, lined with wool and separated by partitions for each instrument. They could be folded, closed with a rod and firmly tied by a knot.¹ The barbers of India still use similar cases for their instruments.

That the razor used to be kept in a case, we know from a passage in the Vṛhadāraṇyaka (800 to 500 B. C.) where the author says "It (the Atman) is here all-pervading down to the tips of the nail. One does not see it any more than a razor hidden in its case or fire in its receptacle".²

¹ स्यान्नवाङ्गुलि विस्तारः सुघनी वादशाङ्गुलः ।
चौम पद्मीर्णं कौषिय दुकूलं मृदु चर्मजः ॥
विन्यस्त पाशः सुस्यूतः सालं रोर्णास्थं शस्त्रकः ।
शलाका पिहितास्य श्व शस्त्रकीषः सुसञ्चयः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

अथ शस्त्राणां सुरचनार्थं शस्त्रकीष माह स्यादित्यादि । नवाङ्गुलिविस्तारः नवाङ्गुलं परिमानविस्तारविशिष्टः शस्त्रकीषः स्यात् । शस्त्रस्य कीषः शस्त्रकीषः । कीष चाप् इति लीके । यथा असिकीष इत्यादि । तथा सुषु, घनी, निविडः सुघनः तथा वादशाङ्गुलः दैर्घ्येण वादशाङ्गुलं परिमानः, तथा चौमादिजः । तथा विन्यस्तः यथा क्रमेण क्रतः पाशो यस्य स विन्यस्तपाशः । तथा सुषु, स्यूतः क्रत सेवनः, सुस्यूतः तथा सालराणि सत्यवधानानि, ऊर्णास्थानि मेषादिलीममध्येष्यतानि, शस्त्रानि यस्मिन् स सालरोर्णास्थशस्त्रकः । तथा शलाकायाः पिहितं स्वागतं आस्य मुखं यस्य स शलाकापिहितास्य तथा सुषु सञ्चयी, नापित भाण्डिकवद्राशीकरणं यस्य स सुसञ्चयः । चौमं अतसौमूवभवस्त्रं केन्विस् ख्यातः । दुकूलशब्दः पद्मादिभिः स्त्रिभिः सम्बद्धते । तेन पट्टदुकूलं पाट् इति ख्यातेन सूत्रेन निर्मितं वस्त्रं ऊर्णा, सेपादिलीम तद्वत् वस्त्रं और्ण दुकूलं वनात् इत्याख्य वस्त्रादि । कौषियदुकूलं कीषकार-कीटभव मूत्रेण रेशम् इति ख्यातेन निर्मितं वस्त्रं ।

Vāgbhaṭārtha Kaumudi.

² Vṛhadāraṇyaka, I. iv.

To prove that portable cases for medicaments and instruments were in use in ancient India, we quote *in toto* from the *Mohāvāgga* some references to them.¹

BOXES FOR OINTMENTS, OINTMENT POTS, AND PORTABLE CASES.

Now at that time, the Bhikkhus used to put pulverised ointments into pots and saucers. They became sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

“I allow, O Bhikkhus, the use of a box for ointment”.

Now at that time the *Khabbaggiya* Bhikkhus used to carry about various kinds of boxes for ointments—gold ones and silver ones. People were annoyed, murmured and became angry, saying, “Like those who still live in the world.”

They told this thing to the Blessed One.

“Various kinds of boxes for ointments, gold ones, and silver ones, are not, O Bhikkhus, to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of such boxes made of bone, or ivory, or horn, or of the nala reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of bronze, or of the centre of the chank-shell (*Sankhu-navi*).”

2. Now at that time the boxes of ointment had no lid. (The ointment) was sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

¹ *Mohāvāgga* vi. 12. (Sacred Books of the East).

"I allow you, O Bhikkhus, the use of a lid."

The lid used to fall off.

"I allow, O Bhikkhus, to fasten the lid with thread and tie it on to the box."

The boxes used to fall.

"I allow you, O Bhikkhus, to sew the boxes on with thread".

3. Now at that time the Bhikkhus used to rub ointment on with their fingers, and the eyes were hurt.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a stiek or holder to put the ointment on with".

Now at that time the *Khabbaggiya* Bhikkhus used to keep various kinds of ointment-stieks—gold ones, and silver ones. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world".

They told this thing to the Blessed One.

"Various kinds of ointment-holders, O Bhikkhus, are not to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of ointment-holders of bone, or of ivory, or of horn, or of the nala reed, or of bambu, or of wood, or of lae, or of fruit, or of bronze, or of the chank-shell."

4. Now at that time the ointment-sticks used to fall on the ground and become rough.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a case for the ointment-stieks".

Now at that time the Bhikkhus used to carry the ointment-boxes and ointment-sticks about in their hands.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a bag to put the ointment-box in."

They had no shoulder strap.

"I allow you, O Bhikkhus, the use of a shoulder strap (by which to carry the ointment-box), or of a thread (by which to sew or tie it on)."

13.

1. Now at that time the venerable Pilindavakkha had head-ache.

"I allow, O Bhikkhus, the use of a little oil on the head".

(The disease) became no better.

"I allow, O Bhikkhus, the practice of taking up (medicine) through the nose". (See commentary on the Dhammapada, pp. 83.)

The nose ran.

"I allow, O Bhikkhus, the use of a nose-spoon" (Nattukaranī).

Now at that time the *Khabbaggiya* Bhikkhus had various kinds of nose-spoons—made of gold, and of silver. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of nose-spoons, O Bhikkhus, are not to be used. Whosoever does so, is guilty of dukkata offence. I allow, O Bhikkhus, the use of such nose-spoons made of bone, (&c., as in chap. 12, 1, down to :) the chank-shell.

2. The nose took up the medicament in unequal proportions.

"I allow, O Bhikkhus, the use of a double nose-spoon (yamaka-natthu-karani)."

They used to spread the drugs on a wick before they sniffed up the aroma: and their throats got burnt.

'I allow, O Bhikkhus, the use of a pipe to conduct the aroma.'

Now at that time the Khabbaggiya Bhikkhus had various kinds of pipes (&c., as in the last clauses of § 1, down to the end).

Now at that time the aroma-pipes came open: and worms got in.

'I allow, O Bhikkhus, the use of a lid to the pipes.'

Now at that time the Bhikkhus carried the pipes about in their hands.

'I allow, O Bhikkhus, the use of a bag to carry the aroma-pipes in.'

The aroma-pipes rubbed against one another.

'I allow, O Bhikkhus, the use of a double bag.'

They had no shoulder strap.

'I allow, O Bhikkhus, the use of a shoulder strap (by which to carry the double bag), or of a thread (by which to sew it on).

OPERATION TABLE.

In the examination for piles, Suśruta directs the patient to lie down on his bed or on a board¹; and in describing the operation, Vāgbhaṭa II mentions a board to be used as an operation table.² A similar bed, as long as the distance from the top of the head to the knees of the patient, is also mentioned in the description of the lithotomy operation.³ The use of a board as a fracture bed is also advised.

For passing the tubes of the *vasti-yantra* or clysters into the urethra in the male, the patient is recommended to sit on a stool as high as his knees (*jānumātrāsana*).⁴

In phlebotomy, the patient is advised to sit on a stool, an aratni high⁵ (*i.e.* the distance between the tip of the olecranon process of the ulna to the tip of the little finger).

¹ भुक्तवल्लमुपवेश्य समृते शुचौ देशे साधारणे व्यभि काले समे फलके श्यायां वा प्रत्यादिव्य-
गुदमन्यस्तोत्सङ्गे निषख्युर्बकायमुत्तानं * * * *

Suśruta Saṁhitā, IV. vi.

² शुचि कृतखस्थ्यन् भुक्तविष्मूत्वमव्यथम् ।

श्यने फलके वान्यनरोत्सङ्गे व्यापश्रितम् ॥

Aṣṭāṅga Hṛdaya, VI. viii.

³ ततो वलवल्लमविक्लवमाजानुसमे फलके प्रागुपवेश्य पुरषव्व तस्तोत्सङ्गे निषख्युर्बकाय-
मुत्तानमुत्त्रतकटीकं ।

Suśruta Saṁhitā, IV. vii.

⁴ स्नातस्य भृक्तभक्तस्य रसेन पथसापि वा ।

स्तृष्टविष्मूत्वेगस्य पौठे जानुसमे सृदौ ॥

Caraka Saṁhitā, VIII. ix.

⁵ तत्र व्यधसिरं पुरुषं प्रत्यादिव्यमुखमरनिमाचीक्षिते उपवेश्यासने ।

Suśruta Saṁhitā, III. viii.

अग्नितापातपखिन्नो जानूचासनसंस्थितः ।

सृदुपद्मात्तकेशान्तो जानुस्थापितकर्पूरः ॥

Aṣṭāṅga Hṛdaya, I. xxvii.

KAPĀTA-ŚAYANA OR FRACTURE-BED.

In the treatment of fractures of the lower extremities, mention is made of the *kapāta-śayana* (*lit. door-bed*) or fracture-bed, consisting of a plank of wood resembling the panel of a door.¹ The patient is to lie down on it. The board has five rods fixed to it, to which the fractured limb is tied to prevent any movement: two on each side of the joint and one on the plantar surface of the foot. Dallāṇa explains it thus²: In fractures of the bones of the leg, two rods are fixed on each side of the ankle and one supports the foot; in fracture of the thigh bone, two rods are fixed on each side of the knee or hip, and one under the foot. In a double fracture of the thigh bone and bones of the

¹ अथ जङ्गोरुभग्रानां कपाटशयनं हितं ।

कौलका वन्धनार्थञ्च पञ्च कार्या विजनता ।
यथा न चलनं तस्य भग्रस्य क्रियते तथा ।
सम्बेरुभयतौ द्वौ द्वौ तले चैकञ्च कौलकः ।
शोणां वा पृष्ठवंशे वा वक्षस्यक्षयोक्तया ।
भग्रसम्बिविमोक्षेषु विधिमेनं समाचरेत् ॥

Suśruta Saṁhitā, IV. iii.

² जङ्गोरुभङ्गेषु पञ्चात् कर्मविशेषं निर्दिशन्नाह । अथ जङ्गे त्यादि । जङ्गोरुभग्र-चिकित्सितमाह । भग्रानाम् काण्डभग्रानाम् । विविधानासपीत्यपरे । कपाटशयनमवश्यं कार्यम् । चलनम् कपाट शयनेनैव सह देशान्तरनयनार्थम् । आधारभूतशयनचालनार्थमित्यन्ये । आधिग्रन्थात्तरावयवचलन परिहारार्थं कौलाः । कौलानां पञ्चसख्यालम् । जङ्गोर्वीर्द्धयोरेकतरस्य भग्रमवेत्य तत्र जङ्गाभग्रे तु गुल्फसम्बेरुभयतौ द्वौ एकञ्च तले एवं पञ्च । ऊरुभग्रे जानुसम्बेरुभयतौ द्वौ द्वौ । वङ्गासम्बेरुभयतस्मै चैक इत्यतापि पञ्च । उभयभङ्गापेच्या तु सप्तमिरेव कौलैर्यन्वणम् । तथाह उभयतौ वहिर्द्वौ गुल्फयोर्द्वौ च जानुनोः द्वौ च वङ्गण्योः तले चैक एवं सप्त । अत्र जङ्गोर्वीर्द्धाः पार्श्वयोर्वीर्द्धाः द्वौ तले चैकञ्च कौलक इति केचित् पठन्ति । तन्निवस्यकारैर्न पठितम् । तस्मान्न पठनीयम् । गयदासशाव पाठान्तरं किमपि पठति । तच्चाभावान्न लिखितम् ।

Dallāṇa's Commentary, IV. iii.

leg, seven rods are required,—two on the outer side of the ankle, knee, and groin, respectively, and one under the foot. The fracture-bed is recommended to be similarly availed of in fractures and dislocations of the loin, the spinal column, the chest, and the clavicle. And this mode of treatment, he adds, may advantageously be used for the other kinds of fractures and dislocations. Vāgbhāṭa II also mentions it in the treatment of fractures¹.

Hippocrates used a similar fracture-bed for the proper treatment of fractures and dislocations. It was called Scammum Hippocratic or bench of Hippocrates. As the figures of this bench would elucidate the structure of the *kapāta-śayana*, we reproduce here three plates with their explanations given at the end of Vol. II, Genuine Works of Hippocrates (Syed. Soc.Ed.), and two plates—Scammum Hippocratis and Plinthium Nilii from the Collection De chirurgiens Grecs.

Fig. 1. The Scammum Hippocratis or Bench of Hippocrates, as represented by Andreas a Cruce (*Officina chirrugica venetiis*, 1596).

Fig. 2. The same as represented by M. Littré.

A. A board, 6 cubits long, 2 broad and 12 inches thick ; not 13 as incorrectly stated by M. Littré.

B. The feet of the Axles, which are short.

¹ कटी जङ्गोरुभग्नानां कपाटशयनं हितम् ।

यन्त्रणार्थं तथा कौलाः पञ्च कार्या विवर्णनाः ॥

जङ्गोर्वीः पार्श्वयोद्दीर्घौ तले एकश्च कौलकः ।

श्रीणां वा पृष्ठवंशे वा वक्रस्याचकयोलया ॥

CC. Axe-trees.

DD. Grooves 3 inches deep, 3 broad, separated from one another by 4 inches.

E. A small post or pillar, fastened in the middle of the machine in a quadrangular hole.

F. Pillars a foot long.

G. A cross-beam laid on the pillars FF, which can be placed at different heights by means of holes in the pillars.

Fig. 3. Representation of the mode of reducing dislocation of the thigh outwards, as given by M. Littré (*Ouv. d'Hipp.*, tom. iv, p. 305).

A mistake in the figure given by M. Littré is here corrected.

A. A lever applied to the nates of the luxated side, and acting from without inwards, in order to bring the head of the bone into its cavity.

B. Another lever, held by an assistant, put into one of the grooves of the machine, and intended to act against lever A.

C. Grove in which the end of the lever A takes its point of support.

D. The luxated member.

EE. Extension and counter-extension.

Fig. 4. Banc d'Hippocrate, d'après Rufus, servant à réduire différentes luxations. (*Collection De Chirurgiens Grecs, Bibliothèque Nationale*).

Fig. 5. Plinthium, ou cadre de Nileus, d'après Héliodore. (*Ibid.*)

CHAPTER IV.

THE NUMBER OF SURGICAL INSTRUMENTS.

The armamentarium of the Hindu surgeons consisted of a good number of surgical instruments. They are described to be of two kinds, the *yantras* and the *śastras*, i.e., the blunt and the sharp instruments. Suśrata enumerates no less than one hundred and one varieties of the blunt instruments, and twenty different kinds of sharp instruments. Hārīta, on the other hand, enumerates twelve blunt instruments, twelve sharp instruments, and four prabandhas, as necessary for the operation of extraction of arrows and other foreign bodies.¹ Vāgbhaṭa II mentions one hundred and fifteen kinds of blunt and twenty-six kinds of sharp instruments. Pālakapya (Treatment of Elephants) mentions ten kinds of *śastras* or sharp instruments though he describes the uses of other instruments required for the surgical treatment of diseases.

INSTRUMENTS AND THEIR CLASSIFICATION (SUŚRUTA).

Of the one hundred and one varieties of the blunt instruments, the surgeon's hand is rightly considered as the principal instrument, for without its help, no instrument can properly be used, and every surgical operation is under its control.² They are recommended to be used for the extraction

¹ वादशेव तु यन्त्राणि शस्त्राणि वादशेव तु ।

चलारि च प्रवभानां शत्र्योऽपारे विनिर्दिशेत् ॥

² यत्क्षतमेकीचरमत्र हस्तमेव प्रधानतमं यन्त्राणामवगच्छ । किं कारणं । यस्माद्यस्तादते यन्त्राणामप्रवक्तिरेव तदधीनल्वायन्त्रकर्मणां ।

तत्र मनःशरीरावाधकराणि शत्र्यानि तेषामाहरणीपायी यन्त्राणि ।

of *śalya* or foreign bodies, e.g., a dart, an arrow, a javelin, a spear, a peg, a pin, a bamboo rod, a stake &c. which cause pain to the body and mind.

A. Suśruta subdivides the blunt instruments into six classes,¹ viz.:

I.	Svastika or cruciform instruments	... 24 kinds.
II.	Sandamśa or pincher-like	... 2 "
III.	Tāla or picklock-like	... 2 "
IV.	Nāḍī or tubular or hollow	... 20 "
V.	Śalākā or rod or pricker-like	... 28 "
VI.	Upayantra or accessory	... 25 "

101

These instruments are advised to be made generally of iron, or of other suitable materials, when iron is not available. Their ends often resemble the faces of some ferocious beasts, or of deers, or birds. Hence the instruments should be so constructed as to have the likeness of their faces, following at the same time the directions of scientific treatises, or the instructions of teachers, or in imitation of other instruments, or in adaptation to the exigencies of the time. They should be of reasonable

¹ तानि पट्टप्रकाराणि । तथा । खस्तिकयन्ताणि । सन्दंशयन्ताणि । तालयन्ताणि । नाडीयन्ताणि । श्लाकायन्ताणि । उपयन्ताणिचेति । तत्र चतुर्विंशति खस्तिकयन्ताणि । हे सन्दंशयन्ते । हे एव तालयन्ते । द्विंशतिर्णाडः । अष्टविंशतिः श्लाकाः । पञ्चविंशति रूपयन्ताणि ।

Suśruta Saṃhitā, I. vii.

Hessler translates the terms as follows: *Uncinata* instrumenta, *forcipum* instrumenta, *palmiformia* instrumenta, *hamata* instrumenta, *secundaria* instrumenta,

Hessler's Suśruta, I. vii.

size, with their ends rough or smooth as required. They should be of strong make, good shape and capable of a firm grasp.¹

I. The Svastika or Cruciform instruments are—

1. Siṁhamukha. 2. Vyāghramukha. 3. Vṛkamukha.
4. Tarakṣumukha. 5. Rkṣamukha. 6. Dvīpimukha.
7. Mārjāramukha. 8. Śṛgālamukha. 9. Airvvārukamukha
10. Kākamukha. 11. Kaṅkamukha. 12. Kuraramukha.
13. Cāsamukha. 14. Bhāsamukha. 15. Śaśaghātīmukha.
16. Ulūkamukha. 17. Cillimukha. 18. Gṛdhramukha.
19. Śyenamukha. 20. Krauñcamukha. 21. Bhṛṅgarājamukha.
22. Añjalikarmamukha. 23. Avabhañjanamukha, and
24. Nandimukhamukha.

II. The Sandamīsa or pincher-like instruments are—

1. Forceps with arms.
2. Forceps without arms.

¹ तानि प्रायश्ची लौहानि भर्वन्ति तत्प्रतिरूपकाणि वा तदलाभे । तत्र नानाप्रकाराणां व्यालानां सृगपच्छिणां मुखेमुखानि यन्ताणां प्रायशः सृष्टानि तस्मात्तस्माक्षयादागमादुपदेशादन्यन्तदर्शनादुपक्रितश्च कारयेत् ।

समाहितानि यन्ताणि खरञ्च्छामुखानि च ।

सृष्टानि सुरूपाणि सुग्रहाणि च कारयेत् ॥

Suśruta Samhitā, I. vii.

अनेकरूपकार्याणि यन्ताणि विविधान्यतः ।

विकल्पय कल्पयेद बुद्धा यथास्थूलन्तु वस्त्वते ॥

* * * * *

अलौहान्यनुशस्त्राणि तान्येवच्च विकल्पयेत् ।

अपराण्यापि यन्त्रादीन्यपयोगच्च यौगिकम् ॥

Aṣṭāṅga Hṛdaya, I. xxv,

III. The Tāla or picklock-like instruments are—

1. Ekatāla.
2. Dwitāla.

IV. The Nādī or tubular instruments are—

For fistula-in-ano ... (1) with one slit; (2) with 2 slits ...	2
For piles ... (1) with one slit; (2) with 2 slits ...	2
For wounds	1
For clisters (Rectal) ... (Some authors describe 3 only) ...	4
For clisters (vaginal and urethral) ... (male and female) ...	3
For Hydrocele	1
For Ascites	1
For fumigation and inhalation ...	2
For Urethral Stricture	1
For Rectal „	1
For Cupping—gourd	1
	—
	20

V. The Śalākā or rod-shaped instruments are—

Gandūpadamukha or earth-worm like ...	2
Sarapuṇkhamukha or arrow-stem like ...	2
Sarpafanāmukha or snake's hood like ...	2
Vadiśamukha or fish-hook like ...	2
Masūradalamukha or masūra pulse like ...	2
Promārjana or swabs ...	5
Khallamukha or spoons ...	3
Jāmvavavadana or jambul seed like ...	3
Añkuśavadana or goad like ...	3
Kolāsthidalamukha or plum seed like ...	1
Mukulāgra or bud shaped ...	1
Mālatīpuṣpavr̥ntāgra or like the stem of mālatī flower	1
	—
	28

VI. The Upayantra or accessory instruments are—

1. Rajju—thread. 2. Veṇikā—twine. 3. Paṭṭa—bandages.
4. Carma—leather. 5. Valkala—bark of trees. 6. Latā—creepers. 7. Vastra—cloth. 8. Aṣṭhilāśma—stone or pebble.
9. Mudgara—hammer. 10. Pānipādatala—palm of the hand and sole of the foot. 11. Āṅguli—finger. 12. Jihvā—tongue. 13. Danta—tooth. 14. Nakha—nail. 15. Mukha—mouth. 16. Vāla—hair. 17. Aśvakaṭaka—the ring of a horse's bridle. 18. Śākhā—branch of a tree. 19. Sthīvana—spittle.
16. 20. Pravāhaṇa—fluxing the patient. 21. Harṣa—objects exciting happiness. 22. Ayaskānta—a loadstone. 23. Kṣāra—caustic.
24. Agni—fire. 25. Bheṣaja—medicines.

B. The sharp instruments or śastras are—

1. Maṇḍalāgra or round headed knife.
2. Karapatra or saw (*lit.* like the human hand).
3. Vṛddhipatra (*lit.* like the leaf of vṛddhi—an unknown medicinal plant)—a razor.
4. Nakha-śastra or nail-parer.
5. Mudrikā or finger-knife (like the last phalanx of the index finger).
6. Utpalapātra, a knife, *i.e.*, resembling the petal of a blue lotus, (*Nymphaea stellata*, Willd.).
7. Arddhadhāra or a single-edged knife.
8. Sūcī—needles.
9. Kuśapatra—a knife shaped like the kuśa grass (*Eragrostis Cynosuroides*).

10. Ātimukha—a knife shaped like the beak of the Āti bird (*Turdus Ginginianus*).
11. Sararī-mukha—a pair of scissors like the beaks of Sararī bird.
12. Antarmukha (*lit. having internal sharp edge*)—a kind of scissors.
13. Trikurccaka—an instrument consisting of three needles.
14. Kuthārikā—a small axe shaped instrument.
15. Vrīhimukha—a trocar shaped like a grain of rice.
16. Arā or awl.
17. Vctasa-patraka—an instrument shaped like the leaf of a rattan (*Calamus Rotang*).
18. Vadīśa—an instrument shaped like the fish-hook.
19. Dantaśaṅku or tooth-pick.
20. Eṣani or sharp probe-like instrument.

According to Hārīta¹ the twelve blunt instruments are—

1. Godhāmukha or iguana-faced. 2. Vajramukha—grdhramukha? 3. Tribaktra or three faced. 4. Sandamśa or pincher.

¹ गोधामुखं वज्रमुखं चिवकूं नाम सन्दशचक्राकृतिकङ्गपादम् ।

अथानां शङ्खकुण्डलञ्च श्रीवत्ससौवत्सिक पञ्चवक्त्रं ।

द्वादशैतानि यन्नाणि कथितानि भिषग्वरैः ।

अथ शस्त्राणि प्रीक्तानि नामानि च पृथक् पृथक् ।

अर्हचन्द्रं श्रीहिमुखम् कङ्गपत्रं कुठारिका ।

करवीरकपत्रञ्च शलाककरपत्रकम् ।

वडिशं ग्रन्थपादञ्च श्लौ च सूचिमुद्ररम् ।

शस्त्राण्येतानि प्रीक्तानि श्लौद्वारे पृथक् पृथक् ॥

5. Cakrākṛti or circular shaped. 6. Anaka ? 7. Kaṅkapāda ?
8. Śṛṅga or horn. 9. Kundala ? 10. Śribatsa ? 11. Saubatsika ?
12. Pañcabaktram, *i.e.*, five faced—śimhamukham ?

The twelve sharp instruments of Hārita are—

1. Arddhacandra or half-moon shaped. 2. Vṛihimukha.
3. Kaṅkapatra. 4. Kuṭhārikā. 5. Karavīrakapatraka. 6. Śalākā or sharp probe. 7. Karapatraka or saw. 8. Vaḍīṣa or sharp hook. 9. Grdhrapāda ? 10. Śūlī 11. Sūcī or needle. 12. Mudgara or hammer ?

Vāgbhaṭa II classifies the instruments in the following way :-

A. Blunt instruments—

I. Svastika, as heron, lion, bear, crow, deer

forceps &c.	24
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II. Sandamśa: It consists of two iron

blades soldered at one end, the other ends being free	2
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<i>(a)</i> for extraction of eyelashes &c.	1
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<i>(b)</i> mucuṭī	1
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III. Tāla 2

<i>(a)</i> Ekatāla	1
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<i>(b)</i> Dwītāla	1
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IV. Nādī or tubular: 23

(a) Kanṭhaśalyāvalokinī or throat speculum

having three and five holes	2
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<i>(b)</i> Śalyanirghātāṇī	1
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<i>(c)</i> For piles, different sizes for male and	6
--	-----	-----	-----	-----	---

female	6
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For inspection : 2 holes—rectal speculum	2
--	-----	-----	-----	-----	---

For medication : 1 hole	2
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For applying pressure : entire—śāmī	2
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(d) For fistula-in-ano: with one and two holes			2
(e) For nasal polypus &c.	1
(f) Ānguli-trāṇaka or finger-guard	1
(g) Joni-vraṇekṣaṇa or vaginal speculum ....	...	...	1
(h) Vrāṇo vasti or wound syringe ....	...	...	1
(i) For dakodara or Paracentesis abdominis			1
(j) Vastiyantra or clysters: rectal, vaginal and urethral .... ... ...	...	...	3
(k) For fumigation... ....	...	...	1
(l) Cupping instruments: Alābu, Ghaṭīyantra and Horns ... ....	...	...	3
			—
			23

V. Šalākā or rod-like instruments	...		34
(a) Gandūpadamukha or earth-worm shaped			2
(b) Masūradalabaktra ....	...	...	2
(c) Šaṅku ....	...	...	9
Faṇibaktra or snake's hood	...	...	2
Šarapuṇkamukha	...	...	2
Vadiṣa or blunt hook	...	...	2
Garvaśaṅku or delivery hook	...	...	1
Aśmarī or lithotomy hook	...	...	1
Šarapuṇkamukha or tooth extractor	...	...	1
(d) For wiping out discharges	...		6
For rectum ....	...	...	2
For nose ....	...	...	2
For ears (karnaśodhana) ....	...	...	2
(e) For application of actual and potential cauteries ....	...	...	11
Jāmvobouṣṭha, three for each	...	...	6

Arddhendu or half-moon shaped, for hernia	1
Kolāsthidala for nasal polypus	...
Nail-shaped	...
(f) For cleansing	...
Rectum	...
Vagina	...
Urethra	...
(g) Collyrium probe	...
	—
	34

VI. Anuyantra or accessory instruments are nineteen in number. To the list of Suśruta he adds the following¹ :—

Goat's gut, silk, time, suppuration, and fear.

B. The sharp instruments of Vāgbhaṭa are twenty-six in number.²

1. Mandalāgra. 2. Vṛddhipatra. 3. Utpalapatra. 4. Adhyaruddhadhāra. 5. Sarpāsyā. 6. Eṣanī:—Gandūpadamukhā and Sūci-mukhā. 7. Vetasa. 8. Śarārī. 9. Trikurccaka. 10. Kuśapatra 11. Ātīvadana. 12. Antarmukha and Arddhacandrānan. 13. Vrīhibaktra. 14. Kuṭhārī. 15. Kuravakasalā. 16. Ānguliśastra. 17. Vadīśa. 18. Karapatra. 19. Kartarī. 20. Nakhaśastra 21. Dantalekhana. 22. Sūci. 23. Kurcca. 24. Khaja. 25. Ārā. 26. Karnavedhānī.

¹ अनुयन्त्राण्यस्तान्त रजु वस्त्राऽस्म मुद्रराः ।
पट्टान्त जिह्वा वालाश्च शाखा नख मुख द्विजाः ॥
काखः पाकः करः पादोभयं हृष्पश्च तत् क्रियाः ।
उपाधवित् प्रविभजेदालोच्य निपुणं धिया ॥

Aṣṭāṅga Hṛdaya. I. xxv.

² पङ्गविंशतिः सुकर्मा रैर्घटितानि यथाविधि ।
शस्त्राणि रोमवाहीनि वाहूल्येनाहूलानि षट् ॥
मुरुपाणि मुधाराणि मुग्हाणि च कारयेत् ।
अकरलानि सुधात सुतीक्ष्णावार्त्ततेऽप्यसि ॥

Ibid. I. xxvi.

Bhāvamiśra mentions the following blunt and sharp instruments: Eṣanī, Jāmvouṣṭha Śalā,¹ Sūci² and knives generally in making incisions which should be shaped like Kharjjūrapatrika, (like the leaf of Kharjjūra tree, Phœnix Sylvesteris, Roxb.) Arddhacandra, Candravarga, Sūcimukha and Abānmukha.³

Pālakapya⁴ mentions ten kinds of śastras :—1. Vṛddhipatra. 2. Kuśapatra. 3. Mandalāgra. 4. Vṛihimukha. 5. Kuthārī. 6. Vatsadanta. 7. Utpalapatra. 8. Śalākā. 9. Sūci or needles. 10. Rampaka. Besides these he refers to Vadīśa.

Of the blunt instruments he mentions:—Jāmvobouṣṭha—(four in number, for application of actual cauteries), Simhadamṣṭrā, Godhāmukha, Kaṇkamukha, Kuliśamukha—(for extraction of foreign bodies), Eṣanī or probes (three), wound syringe, Vastiyantra, Śalākā or rods, yaṣṭhiyantra, Karkataka, Dyātūha, Makaraka (crocodile), Śārddūlamuṣṭhika (tiger's claws), Nandimukha (Turdus Ginginianus).

¹ एषख्या गतिमन्विष्य चारसूत्रानुसारिनीम् ।

सूचीं निदध्यादत्यन्ते प्रोन्नास्याशु विनिहरेत् ॥

Bhāva Prakāśa. II. iv., Nādī Vraṇādhikāra.

² आगलुजे भिषप्राङ्गे शस्त्रेणीत्कृत्य यवतः ।
जाम्बोष्टीनाप्रिवर्णेन तपया वा श्लाकया ॥

Ibid. Bhagandarādhikāra.

³ गतिमन्विष्य शस्त्रेण छिन्दयात् खर्जूरपविकम् ।
चन्द्राईं चन्द्रवर्गेच्च सूचीमुखमवाञ्छुखम् ॥

Ibid.

⁴ तत्र शस्त्राणि दशनामसंस्थानानि भवन्ति । तदथा उद्धिपत्रम्, कुशपत्रम्, मण्डलाग्रम्, व्रीहिमुखम्, कुटाराकृति, वत्सदन्तम्, उत्पलपत्रम्, श्लाका, सूची, रम्पकश्चेति । फालजाम्बवतापिकाद्याकृतयश्चेति । एतान्याप्रिकर्मविधाने चलारि चान्यानि शल्यद्वरणानि यथायीं सिंहद्रंडः गोधामुखं कङ्गमुखं कुलिशसुखं चेति । तिस्र एषिण्यः ।

CHAPTER V.

DESCRIPTION OF THE BLUNT INSTRUMENTS.

Now we shall describe the instruments in detail. The Yantras or the blunt instruments will be considered first, and next the Sastras or the sharp instruments.

I. The Svastika yantra or Cruciform Instruments.

The word svastika is a technical term signifying one of the twenty-four signs of the Jinas; and it can be represented by two lines crossing each other, the arms of the cross being bent at their extremities towards the same direction. So these instruments may be described as cruciform. They have, as a rule, a length of eighteen anguli. Their ends should be shaped like the faces of the following ferocious beasts (1 to 8), deer (9), and birds (10 to 24), and the instruments are to be called after their names.¹ They are divided into two classes; the instruments of class I resemble the mouths of lion (simha) and tiger (vyāgra), while class II comprises the instruments which have the likeness of the faces of birds of prey. The fulcrums of these instruments which are at the middle, are of the size of a masūra (Ervum lens). The handles are either rounded off, or bent at an angle at their ends, like an elephant driver's goad—the object being to afford a good grasp of the instrument by the surgeon's hands. The svastika instruments are used for the extraction of

¹ तत्र स्वस्तिकयन्त्राण्याद्ददशाङ्गुलप्रमाणानि सिंहव्याघ्रवक्तरञ्जुञ्जचौपिमार्जारशगालमृगै
ब्लाष्टककाककङ्गुररचासभासशशघाल्यलूकचिञ्चिश्येनगटप्रकौच्चभङ्गराजाङ्गलिकर्णावभञ्जननन्दि-
मुखमुखानि मसूराकृतिभिः कौलेरववद्वानि मूलेऽङ्गुशवदावत्तवारङ्गाण्यास्थिविनष्टश्ल्यीङ्गार-
णार्थमुपदिश्यन्ते ।

foreign bodies impacted in the bones.¹ If the foreign body is visible, extract it by the lion forceps or similar forceps of class I. If it is invisible, it should be extracted by the Heron forceps or similar forceps of class II. Of all the varieties of svastika instruments, the Heron forceps (kaṅkamukha) is the best, for it can be easily introduced and turned in all directions, and also it grasps firmly and extracts a foreign body with ease and can be applied without any harm to all parts of the body.²

Class I :—

1. Simhamukha svastika or Lion-faced forceps :—this instrument is said to have its mouth shaped like that of a lion (*Felis leo*). It is the principle instrument of the class I. It is

¹ तुल्यानि कङ्गसिंहर्द्धकाकादिसृगपच्छिणां ।
मुखैर्मुखानि यन्वाणां कुर्यात् संज्ञकानि च ॥
अष्टादशाङ्गुलयामान्यायसानि च भूरिशः ।
मसूराकारपर्यन्तेः कण्ठेवद्वानि कौलकैः ॥
विद्यात् स्वस्तिक यन्वाणि मूलेऽङ्गुशनतानि च ।
ते दृढैरस्थिसंलग्न श्ल्याहरणमिष्यते ॥

Aṣṭāṅga Hṛdaya. I. xxv.

² दृश्यं सिंहमुखाद्यस्तु गूढं कङ्गमुखादिभिः ।
निर्हरेतु श्लैः श्लैः श्लैः श्लैः श्लैः श्लैः ॥
विवर्तते साध्ववगाहते च श्लैः निरहृद्योङ्गरते च यस्मात् ।
यन्वेष्वतः कङ्गमुखम् प्रधानं स्थानेषु सर्वेष्वधिकारि चैव ॥

Suśruta Saṃhitā I. vii.

निवर्तते साध्ववगाहते च
ग्राह्यं गटहृदीबोङ्गरते च यस्मात् ।
यन्वेष्वतः कङ्गमुखं प्रधानं
स्थानेषु सर्वेष्वधिकारि यत्त्वा ॥

Aṣṭāṅga Hṛdaya. I. xxv.

curious that in modern times, the European surgeons use a pair of forceps called the Lion forceps for holding bones firmly during operations. So the Makaramukha of Pālakapya is the Crocodile forceps.

2. Vyāghramukha or Tiger forceps: the mouth of this instrument is like that of a tiger (*Tigris regalis*).
3. Vṛkamukha or Wolf forceps (*Canis lupus*).
4. Tarakṣumukha or Hyena forceps (*Hyena striata*).
5. Rkṣamukha or Bear forceps (*Ursus Americanas*).
6. Dwīpimukha or Panther forceps (*Felis pardus*).
7. Mārjāramukha or Cat forceps (*Felis domestica*).
8. Śrgālamukha or Jackal forceps (*Canis aureas*).
9. Airbbāruka or Deer forceps (*Cervus elephas*).

Class II:—The birds, in imitation of whose faces the instruments of this class are made, can be identified from the following discription of their beaks :—

Birds: 1. Raptatories: they have curved beaks hooked at the extremity.

(a) Strigidæ...owls...strong hooked beaks bent down from base.

(b) Vulturidæ...vultures...long straight beaks bent down at tip.

(c) Accipetridæ...falcons, osprey and eagle...short, usually dentated beaks, hooked at the ends.

2. Pessaries...(a) Lanidæ...shrike...hooked and strongly serrated beak. (b) Cervidæ...crow and blue-jay...beaks strong, thick, somewhat curved anteriorly and slightly notched.

3. Grallatories...Heroidæ or Ardeidæ...herons and krauñca...they have long and powerful beaks with sharp hard

edges, somewhat curved at the point, rarely spoon-shaped, with long neck.

The instruments are—

10. Kākamukha or Crow forceps (*Corvus corone*).
11. Kaṅkamukha or Heron forceps (*Ardea cenerea*).
12. Kuraramukha or Osprey forceps (*Pandion haliaetus*).
13. Cāsamukha or Blue-jay forceps (*Garrulous* or *Corvus cristatus*).
14. Bhāsamukha or Eagle forceps.
15. Śaśaghātīmukha or Hawk forceps (*Nanclerus furcatus*).
16. Ulūkamukha or Owl forceps (*Strix flammea*).
17. Cillimukha or Kite forceps (*Milivus ictimus*).
18. Śyenamukha or Vulture forceps (*Vulture cinereas*).
19. Gr̥dhramukha or Falcon forceps (*Peregrine falcon*).
20. Krauñcamukha (*Ardea jaculator*); or Curlew (*Numenius Arquatus*).
21. Bhṛ̥ngarājamukha or Fork-tailed or Butcher-bird forceps (*Lanius excubitor*).
22. Añjalikarṇamukha—birds not identified.
23. Avabhañjanamukha „ „ „
24. Nandimukhamukha (*Turdus Ginginianus*).

II. The Sandamśa or Pincher-like Forceps.

The second class of instruments—the Sandamśa¹ or pincher-like forceps—comprises only two instruments : the forceps with and without handles. The first variety is likened

¹ सनियहीऽनियहश सन्दंशौ षोडशाङ्कुलौ भवतस्त्वग्माससिरान्नायुगतश्ल्योद्धारण्यार्थं मुपदिश्यते ।

to forceps with arms, used by the barbers for depilating the nasal cavities, while the second variety is like the armless forceps used by the goldsmiths. The former consists of two arms joined crosswise by a pin fixed at about their middle points, and so really is a cruciform instrument but is classed here for its different use in surgery. The forceps without handles consists of two blades soldered at one end. Some commentators like to subdivide the pinchers into two classes according as their ends are rough or smooth. And so Hessler translates:¹ “Duae forcipes denticulata et non denticulata”.

The sandamśas are used for the purpose of extracting foreign substances from the soft structures of the human body, such as the skin, muscles, veins, nerves, and tendons². Generally they have a length of sixteen aṅguli.

Vāgbhaṭa II mentions two other instruments as modifications of the type :—

(a) One variety has the length of six aṅguli. It is intended for the purpose of extracting minute foreign bodies such as thorn, hair &c. and of removing the superfluous eyelashes.³

Cakrapāṇi also advises us to use a sandamśa for epilation, which may be called the Epilation forceps.⁴

¹ Hessler's Suśruta. Caput vii. P. 14.

² कौलवङ्ग नियुक्तायौ सन्दंशौ षीडशाङ्कुलौ ।
लकसिरास्तायुपिश्चित लग्न श्ल्यपकर्षणे ॥ ५ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

अतिग्रस्त श्ल्यस्त सन्दंशेन समुद्धरेत् ।

Hārīta Saṁhitā, III. lvi.

³ षडङ्कुलोऽन्योहरणे मूल्म श्ल्यो पपत्त्वाणां ॥ ६ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ See foot-note 2, p. 66.

Similarly in modern times, we remove superfluous eyelashes by the Epilation forceps. Mr. Berry writes¹:—"When the trichiasis is only partial, a temporary improvement is obtained by epilation. In some cases where a few eyelashes only have been left altogether, the patient may procure for himself a pair of forceps, and have the eyelashes removed whenever they cause irritation." Surgical epilation was frequently necessary for trichiasis among the Romans and a similar forceps was in use there.²

In ancient times in India, the barbers used epilation forceps for pulling out grey hairs. In Makha-deva jātaka, we find the following conversations between the king and his barber³ :—

"Barber. There is a grey hair to be seen on your head, O King."

King. Pull it out, then, friend, and put it in my hand.

So he tore it out with golden pinchers, and placed it in the hand of the King."

(b) The second variety is known as the Mucuṭī instrument.⁴ It is a pair of straight forceps, having no curve like that of the sandamśa. It is serrated finely at the open ends. The soldered end has a ring attached to it as ornamentation. It is recommended to be used for removing painful sloughs and proud granulations from a deep-seated abscess. It is also to be used to

¹ Practical Ophthalmology, 1904. By G. A. Berry, M.B. P. 52.

² Paulus Aegineta. VI. xiii. (Syd. Soc. Ed.)

³ Rhys David's Buddhistic jātaka stories, Vol. I, pp. 187.

⁴ मुचुटी सूच्च दलर्जुमूले रुचकभूषणा ।

गन्धीर ब्रणमांसार्त्ती चामर्णणः शोषितस्य च ॥ ७ ॥

complete the operation for pterygium by removing the remnant, after it has been extirpated by the sharp instruments. Suśruta calls it *Mucundi*¹, and uses it to hold the pterygium after it has been raised by *vadiṣa* or hook. It must be then a smaller variety of *mucutī*.

A similar pair of forceps, Dr. Erichsen mentions, and says² that "for the purpose of extracting needles, thorns, splinters of wood and other foreign bodies of small size and pointed shape lying in narrow wounds, forceps with very fine but strong, well-serrated points will be found useful."

Suśruta mentions *bainsabidala*³ or bamboo forceps. It is made of a piece of bamboo rod, split longitudinally into two halves nearly to its whole extent. This is like the bamboo tongs used by the smokers in Bengal to raise glowing charcoal to the earthen bowl. It should be used to remove worms from the surface of the human body.

The *sandamī* instrument may be compared with the modern dressing forceps and with the forceps still used by the goldsmiths, known as a *sonnā*. Those with arms have their counterpart in the *sāḍāsī* or a pair of pinchers, still used by the blacksmiths.

III. Tāla Yantra or Picklock-like Instruments.

The third class of blunt instruments is called *Tāla-*

¹ अपाङ्गं प्रेक्षमाणस्य वडिशेन समाहितः ।
मुचुख्यागृह्य मेधावी सूचीसूचेण वा पुनः ॥

Suśruta Saṁhitā, vi. xv.

² Erichsen's Science and Art of Surgery, Tenth Ed. vol. I. p. 342.

³ ताननुतेनाभ्यक्तस्त्र वंशविद्लेनापहरेत् ।

Suśruta Saṁhitā, IV. xxvii.

yantra¹. The word tāla “has been differently interpreted by the commentators. Bhānumatī gives the alternative reading (tālu i.e., palate) for tāla, so the instruments likely had their ends shaped like the palatine process of fish. Dallana,² however, maintains that tāla means picklock, the ordinary Indian key which resembles a hook. Two of these are joined at one end, the curved ends being kept free, facing one another. The instrument would then resemble the face of a bhetuli fish. Instruments with one tāla or hook resemble one lip of the fish, and those with two tālas represent its entire face. Both Cakrapāṇi and Dallana however prefer to mean by tāla, the scale of a fish.”

They have a length of twelve aṅguli, and are shaped like the jaws of a fish. They may be made either with a single blade (ekatāla) or with double blades (dvitāla) soldered at one end, the hooked ends being free. They are intended for the purpose of extracting foreign bodies from the ear, nose and other outer canals of the body. The ear scoop now used by the barbers of India for extracting wax from the ear is a tālayantra.

¹ तालयन्त्रे द्वादशाङ्गुले मत्स्यतालुवदेकतालदितालके कर्णनासानाडीश्ल्यानामा-हरणार्थं ।

Suśruta Saṁhitā, I. vii.

द्वे द्वादशाङ्गुले मत्स्यतालुवदेक तालके ।

ताल यन्त्र मृते कर्णनाडी श्ल्यापहारिणी ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² अत ताल-श्लेन प्रदेश उच्यते । एतेन एक' तालं प्रदेशी यस्य तदेकतालं, द्वे ताले प्रदेशी यस्य तत् द्वितालकम् ; एतेन मत्स्यस्य श्लक्वतप्रतनुमुखैरप्रदेशं एकताल मत्स्यश्लक्वत् प्रतनुमुखैः द्विप्रदेशं द्वितालमित्युक्तम् । परिणाहस्तु कर्णादिप्रवेशी ज्ञेयः । अन्ये तु मत्स्यतालकवदेकतालकदितालके इति पठन्ति । व्याख्यानयन्ति च मत्स्यव भेटुनिमत्स्यः, तस्य लौहमयतालकाकारं मुखं भवति अतस्मुखाङ्गाकारं यन्त्रमेकतालकं, सर्वमुखाकारं द्वितालकं, तालकोऽचअपवारकादिपाठसम्बिवन्धनं लौहमयमुच्यते ।

Dallana's Commentary, I. vii.

For removing substances that have fallen into the meatus auditorius, Paul says:¹ "They must therefore be extracted by an earpick, a hook, or tweezers, or by using powerful shaking of the head, while the ear is placed upon some circular board." Albucasis recommends us to use a slender forceps, which resembles the modern dissecting forceps. He also commends for the purpose a hook slightly bent, which is also mentioned by Celsus.²

IV. The Nādī Yantra or Tubular Instruments.

The Nādī or tubular instruments are described to be of various kinds and to serve many purposes³. They are open either at one or both ends. These are used for the extraction of foreign substances from the natural outlets of the body. They are also recommended to be used as a diagnostic apparatus for inspection of diseases in the canals. They are the means of sucking out fluid discharges, as pus *etc.*, from cavities and they facilitate the performances of other operations. They vary in length and diameter in proportion to the different sizes of the outer canals of the body, or according to the varieties of purposes to be served by them.

¹ Paulus Aegineta, Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² Celsus, VI.

³ नाडी यन्त्राणेकप्रकाराखणेक प्रयोजनाव्येकतीमुखान्युभयतीमुखानि च तानि स्त्रीती-
गतशल्यं द्वारणार्थं रोगदर्शनार्थमाचूषणार्थं क्रियासौकार्यार्थं चेति तानि स्त्रीताम्परिणाहानि
यथायोग परिणाहद्वीघाणि च ।

Suśruta Saṃhitā, I. vii.

नाडीयन्त्राणि शुष्पिराखे कानेक मुखानि तु ।

स्त्रीतीगतानां शल्यानामयानां च दर्शने ।

क्रियाणां सुकरत्वाय कूर्यादाचूषणाय च ।

तदिस्तार परिणाह दैव्यं स्त्रीतामुरीधतः ॥ ८ ॥

The tubular instruments are used for fistula-in-ano, haemorrhoids, tumours, abscesses, injections into the rectum, vagina and urethra, hydrocele, ascites, inhalations, stricture of urethra and rectum and cupping as by gourd and horns.¹

As examples of the tubular instruments, Vāgbhaṭa II. mentions :—

1. KANTHASALYĀVALOKINI² OR THROAT SPECULUM.

To examine foreign substances such as a fish-bone in the throat, the instrument should have a length of ten aṅguli and a circumference of five aṅguli.

Suśruta describes the extraction of a foreign body, made of lac from the throat of a patient by the following device. A heated iron probe or sound should be introduced into the throat of a patient through a tube of copper and made to touch the bit of shellac. The foreign substance would begin to dissolve or soften and so will adhere to the probe. The rod is then to be cooled by sprinkling water through the tube and the foreign body then should be drawn out steadily with it.³ But other kinds of foreign bodies are to be extracted from the throat by means of a rod-like instrument, one end of which is smeared with melted wax or shellac.

The use of some adhesive substance for extraction of foreign bodies accidentally introduced into the outer passages of the

¹ भग्नदराशीर्वूदत्रणवस्तुपत्तरवस्तिमूत्रद्विदकोदरधूमनिरुद्धप्रकाशसन्त्रिरुद्गदयन्ताण्यलावूशङ्गयन्ताणि चोपरिष्टाइच्यामः।

Suśruta Saṁhitā, I. vii.

² दशाङ्गुलार्द्दनाहान्तः कण्ठश्ल्यावलीकिनी।

Aṣṭāṅga Hṛdaya, I. xxv.

³ जातुषे कण्ठासके कण्ठे नाड़ी प्रवेश्याग्नितपात्रं श्लाकां तथावगृह्य शौताभिरद्विपरिषिच्य म्यरीभूतमुद्दरेत्। अजातुषं जतुमधूच्छिष्टलिमया श्लाकया पूर्वकर्षपेनेवेके।

Suśruta Saṁhitā, I. xxvii.

human body was well known to the Greeks and Romans. Paul says:¹ "Stones and such like bodies we extract by wrapping wool round an earpick, and smearing it with turpentine-rosin, or some glutinous substance, and introducing it gently into the meatus auditorius."

2. PAÑCAMUKHA AND TRIMUKHA.

To take a good hold of a four-eared arrow, a speculum having five holes (PAÑCAMUKHA) should be had recourse to; and for a two-eared arrow, a speculum having three holes (TRIMUKHA) would be necessary. The central hole is for the arrow, while the side holes are meant for the ears of the arrow.²

Celsus³ says that when a weapon buried in the flesh has barbs too strong to be broken with forceps, they may be shielded with split writing-reeds (*Calamus scriptorium*), and the weapon thus withdrawn.

Paul says: "Some apply a tube round about the barbs⁴ so that when they draw out the weapon, the flesh may not be torn by the barbs."

In modern times a snare is used instead of a tube. Dr. Erichsen⁵ writes: "The extraction of an arrow is usually attended with little difficulty. But if barbed, special precautions have to be taken. With the view of safely effecting its removal, the snares.....have been devised."

¹ Paulus Aegineta. Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² नाडौपचमुखच्छिद्रा चतुर्कर्णस्य संयहे ।

वारङ्गस्य दिकर्णस्य त्रिच्छिद्रा तत् प्रमाणतः ।

Aṣṭāṅga Hṛdaya, I. xxv.

³ Celsus. vii. v.

⁴ The Works of Paulus Aegineta. vi. lxxxvii.

⁵ The Science and Art of Surgery. Vol. I. pp. 343.

3. TUBULAR INSTRUMENTS FOR INSPECTION OF ARROWS.

Again for the inspection of the arrows, various kinds of tubular instruments would be necessary, which will vary according to the shape, length, and circumference of the arrows and their ears.¹

4. ŚALYANIRGHĀTANĪ.

The top of this tubular instrument is shaped like the disc of a lotus and is closed. The other end is open and leads to a hollow extending to a fourth part of the tube. It has a length of twelve aṅguli. It is useful for removing an arrow fixed deeply into the body, in different directions and thus helping its easy extraction.² For this purpose Suśruta directs us to use a stone hammer.

The Śalyanirghātanī had its counterpart in the female part of the Impellent, mentioned by Paul, for forcing an arrowhead forwards through a part so as to extract it at the side opposite to that of its entrance. It would thus be seen that the function of the Impellent was similar to that of the Śalyanirghātanī ; the former moved it forwards, while the latter moved the śalya side to side, the object of both being to extract the foreign substance. The Impellent would seem to have been a plain rod of metal pointed at one end (the male part) and hollowed at the other (the female part) ; the pointed end used to be introduced into the socket of an arrow when it possessed one, and the hollow

¹ वारङ्ग कर्णसंस्थान नाहै दैर्घ्यानुरीधतः ।

नाडीरेवं विधाशान्या द्रष्टुं गत्याणि कारयेत् ॥ १० ॥

Aṣṭāṅga Hṛdaya, I. xxv.

² पद्मकर्णिकया मूङ्गि॑ सट्टगी द्वादशाङ्गुला ।

चतुर्थ शुपिरानाडी गत्यानिर्घातनी मता ॥

Ibid.

end was meant to fit over the tail in case where the arrow was tanged.¹ The Greeks and Romans recognised the necessity of an arrow being moved about until loosened, if it remained fixed in the bone; and Celsus² directs us to strike it with some iron instrument until it be shaken from the place where it is lodged.

5. TUBULAR INSTRUMENTS FOR PILES.

According to Suśruta³ these should be made either of iron, or ivory, or horn or wood. They are hollow instruments tapering at the end which should be shaped like the teat of a cow. For males, the length is four aṅguli, while the circumference is five aṅguli. In the case of females, however, the tube should be made wider, the circumference being six aṅguli, and longer, the length being equal to the space covered by the palm of the hand. There are two slits on the sides—one for inspection of diseases and the other to allow application of caustic and cautery to the diseased part. The slit measures three aṅguli in length and the pulp of the thumb in breadth. At a distance of a half aṅguli from the margin of the slit, is raised a circular projection, also a half aṅguli high.

¹ Paulus Aegineta, VI. lxxxviii.

² Celsus, VII. 5.

³ तत्र यन्त्रं लौहं दानं शार्ङ्गं वार्णं वा गीस्तनाकारं चतुराङ्गुलायतं पञ्चाङ्गुलपरिणाहं पुंसा षडङ्गुलपरिणाहं नारीणां तलायतं तदविच्छिद्रं दर्शनार्थमेकं क्षिद्रमेकं क्षिद्रन्तु कर्मणि । एकद्वारे हि शस्त्रचाराग्रीनामतिक्रमो न भवति । क्षिद्रप्रमाणन्तु त्राङ्गुलायतमञ्जुडोहरपरिणाहं यदञ्गुलमवशिष्टं तस्याङ्गाङ्गुलमधस्तादञ्जुलीच्छितोपरिष्ठकर्णिकमेषयन्त्राकृतिसमाप्तः ।

Vāgbhaṭa¹ describes two different instruments, one for inspection and the other for medication. They both have the same length and circumference. The former has two slits on the side, while the latter has only one slit, three aṅguli long and the pulp of the thumb in width. The annular projection is turned upwards : the object being the prevention of sudden introduction of the instrument too far inwards.

A similar instrument without any slit on the side is called Samī². It is advised to be used for exerting pressure over the piles by its introduction into the rectum (Vāgbhaṭa.)

Rectal speculum is mentioned by Hippocrates in his treatise on fistula³ and by Paul in the treatment of piles.⁴ It is called Calopter in contradistinction to the vaginal speculum which is called Diopter. The rectal speculum in the Naples museum is a two bladed instrument working with a hinge in the middle. In modern times, both the varieties of the speculum, tubular and valved, are in use.

For inspection and medication of piles, a tubular speculum is recommended to be used by the veterinary surgeons. In the

¹ अर्शसां गोलनाकारं यन्त्रकं चतुरङ्गुलम् ।

नाहि पञ्चाङ्गुलम् पुंसां प्रमदानां षडङ्गुलं ।

दिक्षिद्रं दर्शने व्याधिरेकच्छिद्रन्तु कर्मणि ।

मध्येऽस्य चतुरङ्गुलच्छिद्रमङ्गुष्ठोदर विसृतम् ।

अङ्गाङ्गुलीच्छितीहृत कर्णिकञ्च तदृङ्गुतः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² शम्याख्यां ताटगच्छिद्रं यन्त्रमर्शः प्रपीडनं ॥ १३ ॥

Ibid.

³ The Genuine Works of Hippocrates. (Syd. Soc. Ed.) Vol. II. P. 817.

⁴ Paulus Aegineta, VI. lxxix.

Aśvavaidyaka, Jayadatta sūri¹ describes the instrument thus : "The surgeon should know the instrument to have the length of six aṅguli. On the two sides, the wise surgeon should make two slits, three aṅguli long and a half aṅguli broad. Through an instrument with two slits, the piles of the horses should be examined. Through a speculum with one slit, the surgical operations, such as incisions &c., should be performed, after having tied the horse and making him lie down".

6. TUBULAR INSTRUMENTS FOR FISTULA-IN-ANO.

These are similar to the instruments used for the inspection and medication of piles, the only difference being the omission of the circular rings in their construction, for otherwise, the projection may rub over the sore if the speculum be introduced deeply.²

¹ यन्त्रं घडङ्गुलं विद्वान् च्छिरं पञ्चाङ्गुलं भिषक् ।

अधोऽर्द्धाङ्गुलाविस्तीर्णं दैच्येणाप्यङ्गुलवयम् ॥

उभयोः पार्श्वयोस्तस्य कुर्याच्छिरद्वयं बुधः ।

अर्शस्तेन तु वाहस्य विच्छिद्रेण विलोकयेत् ॥

एकच्छिद्रेण वै कर्म्म कुर्याच्छेदादि पूर्वकम् ।

पातितस्य सुवङ्गस्य तुरङ्गस्य विचरणः ॥

Aśvavaidyaka (Bibliotheca Indica). Liii. vs. 4, 5 and 6.

² छिद्रादूर्धं हरेदीष्मर्गयन्त्रस्य यन्त्रवित् ।

ततो भग्नदरे इद्यादेतदर्द्देन्द्रु सत्रिभं ॥

Suśruta Saṃhitā, IV. viii.

सर्वथाऽपनयेदीष्टं छिद्रादूर्धं भग्नदरे ।

Aṣṭāṅga Hṛdaya, I. xxv.

7. TUBULAR INSTRUMENTS FOR THE NOSE.

Nasal-Speculum.

Similar tubular instrument without ring is to be used for examination of nasal diseases as tumours and polypus. It is however shorter and thinner than the rectal speculum. Vāgbhaṭa says: "It is two aṅguli long and admits the index finger in its lumen. The tube has a single slit on the side."¹

He describes nasal tubes for introducing medicated powders into the nose as snuff.² After partially filling the tube with powders, one should blow through the empty end, the other end being put well inside the nasal cavity. Suśruta also uses a tube to blow powder into the nose.³ Caraka⁴ mentions nasal insufflation to cure diseases. Śāringadhara⁵ and Cakradatta⁶ describe the nasal tube for insufflation to be six aṅguli long and open at both ends.

¹ नाडार्बुद्धार्शसामेकच्छिद्रा नाडाङ्गुलहया ।

प्रदेशिनी परिणाहा स्याङ्गन्दर यन्वत् ॥ १५ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

² आनं विरेचनशूर्णे युज्जात् तं सुखवायुना ।

षडङ्गुलहिमुखया नाडा भेषजगर्भया ।

Ibid. I. xx.

³ नासासावे नाणतश्चूर्णमुक्तां नाडादेयं योजवपीडश्तीक्ष्मः ।

Suśruta Saṃhitā, VI. xxiii.

⁴ सिद्धिं स्थानावनं चूर्णचैषां प्रधमणे हितं ।

Caraka Saṃhitā, VI. xxvi.

⁵ षडङ्गुला दिवक्रा या नाडी चूर्णलयी धर्मेत् ।

तीच्छ्रं कीलमितम्बक्तु वातैः प्रधमनं हितं ॥

Śāringadhara Saṃgraha, III viii.

⁶ आपनं रेचनश्चूर्णे युज्जात् तत् सुखवायुना ।

षडङ्गुल हिमुखया नाडा भेषजगर्भया ॥

Cakradatta, Nasyādhikāra.

Aretaeus says that a quill or reed or a wide long tube may be used for blowing powders into the pharynx. Alexander Trallianus² says that a calamus scriptorium, the joints of which have been removed, may be used as an insufflator. Oribasius³ however gives the fullest description of the tube used as a nasal insufflator. "A reed slender and with a straight bore, 6 inches in length, and of such a size that it can be passed in the nares, is taken and its cavity entirely filled with medicament. The reed may be either natural or of bronze. This being placed in the nares, we propel the medicament by blowing into the other end."

In modern times, we advise our patients to do the same thing when powders are prescribed to be thrown into the nose or ears. The cylindrical shaft of the ordinary quill so cut as to be open at both ends will serve the purpose admirably. The nasal insufflator is used now for identical object.

Aretaeus⁴ mentions a nasal syringe with a double tube. It consists of two pipes united together by an outlet so that liquid medicine may be injected into both the nasal cavities simultaneously, for injection into each nostril separately, he points out, can not be borne.

It is remarkable that in Mahāvāgga⁵ mention is made of single and double nose-spoons. Nāthu-karaṇi (*i.e.*, an instrument to hold up the nose, so that the medicated oil

¹ Aretaeus, Vol. II., P. 408.

² Alexander Trallianus, IV. viii.

³ Oribasius Collect, xii.

⁴ Aretaeus, Ed. Adams, Vol. II., P. 459.

⁵ Mahāvāgga, VI. 13. 1 & 2. Sacred Books of the East.

does not run out...Ed.) and Yamaka-nāthu-karāṇī (i.e., one that would go up both nostrils...Ed.). They are recommended to be made of gold, or silver, or bone, or ivory, or horn, or of the *nala* reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of chank-shell". (Sacred Books of the East).

To apply oily medicines inside the nasal cavity a cotton wick is first soaked in the oil and then it is pushed well inside the nose. It is recommended also to pour oil into the cavity through a tube, while the other cavity is pressed by a finger (Vāgbhāṭa¹).

To treat a case of fracture of the nasal bones, Suśruta recommends² two straight tubes open at both ends to be introduced into the nasal cavities, after putting the fractured ends in position, either lowering or elevating the raised or depressed end by a rod as required. Then bandages are to be applied. The tubes serve as splints to support the broken ends in position, while through their orifices the patient may breathe without inconvenience.

Similarly Celsus, after replacing the fractured ends in position uses oblong tents sewed round with a thin soft skin as splints into the nostrils; or a large quill smeared with gum, or artificer's glue may be applied in the same way. Paul also

¹ नासापुटं पिघायैकं पर्यायेण निषेचयेत् ।

उणास्तु भेषज्यं प्रनादा पिचुनाऽथवा ॥

Aṣṭāṅga Hṛdaya, I. xx.

² नासां सन्नां विकृतां वा क्रचीं क्लता श्लाकया ।

पृथग् नासिकयोनाडौ द्विमुखौ संप्रवेशयेत् ॥

ततः पङ्केन संवेष्ट्य घृतसेकं प्रदापयेत् ॥

Suśruta Saṃhitā, VI. iii.

says: "And some sew the quills of the feathers of a goose into the rags, and thus introduce them into the nose, in order that they may preserve the parts in position without obstructing the respiration; but this is unnecessary as respiration is carried on by the mouth."¹

Sūsruta also advises us to introduce these tubes into the nasal cavities during the performance of the Rhinoplastic operations.²

8. THE AṄGULI-TRĀṄAKA OR FINGER-GUARD.

Vāgbhaṭa says:³ "It is generally made either of ivory or wood. The instrument is shaped like the teat of a cow, and is four aṅguli long. Two slits occur on the sides like those in the speculum for piles."

It protects the finger of the surgeon from being injured by the teeth of the patient and so helps the surgeon in opening the mouth of the patient with ease.⁴

In modern times, finger-guards are used for the same purposes.

¹ Paulus Aegineta, Vol. II. vi, xci. Syd. Soc. Ed.

² सुर्वंहितं सम्यगथो यथावद्राङ्गीइयेनाभिसमीच्छ वज्ञा ।

प्रोन्नत्य चैनामवचूर्णयेच्च पत्तङ्गयष्टीमधुकाङ्गनैश ॥

Sūsruta Samhitā, I. xvi.

³ अङ्गुलिचाणकं दान्तं वार्चं वा चतुरङ्गुलम् ।

दिक्षिद्रुं गोसनाकारं तदक्तविहृतौमुखं ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ तच्च वक्त्रं विष्टतौ, सम्बृतं सुखसातुरस्य सुखव्यादानं निमित्तं सुखं सुखकरं स्यात् ।
यत इदं दन्तघातात् रचति अत उक्तं सुखमिति ।

Vāgbhaṭartha Kaumudi, I. xxv.

अङ्गुलिदन्तेभ्यो रचण्यार्थत्वांदङ्गुलिचाणकमिति नाम ।

Sarvāṅga Sundarī, I. xxv.

9. JONI-VRAṄEKṢĀNA OR VAGINAL SPECULUM.

Vāgbhaṭa¹ describes it to be a tubular instrument, sixteen aṅguli long, and six aṅguli in circumference. It consists of four blades, attached at their bases to a ring. The tube tapers gradually, the end is free and looks like the bud of a lotus. To the four blades are soldered four rods in such a way that on pressing their free ends, which pass out of the ring, by the surgeon's hands, the tapering end of the tube would gape widely. The surgeon by regulating the pressure of his hand, may open or close the speculum to any desired extent.

Another kind of vaginal speculum used to be manufactured out of the two horns of a buffalo by dividing each into two longitudinal halves. They should be so paired that their concave surfaces would look towards one another, their ends diverging outwards. So we get a pair of bivalve speculum out of a pair of horns.

The bivalve speculum of horn mentioned above, has its modern counterpart in the pair of speculum known as Barne's or Neugebauer's speculum.

¹ योनिब्रणेच्चणं मध्ये शुष्ठिरं षोडशाङ्गुलम् ।

मुद्रावङ्मं चतुर्भिंचमधीज मुकुलामनं ।

चतुःश्लाकमाक्रान्तं मूले तदिकसेन्मुखे ॥ १७ ।

Aṣṭāṅga Hṛdaya, I. xxv.

अस्य यन्त्रस्य कल्पनायां चत्वारिंशत्वरुहानि तथा कार्याणि यथा सुद्धिकथा वज्जानि मिलितानि च पद्मसुकुलाकार सुखा, अन्तर शुष्ठिरा षड्ङुलं परिणाहवती नाडी स्यात् । ततस्तन्मध्ये प्रत्येकं खण्डसंलग्नं चतुर्सः श्लाकाः आसुखात् सन्निवेश्य श्लाकानामध्यभागे तथा वज्जीयात् यथा श्लाकामूलं पौड़नेन यन्त्रस्य सुखं विकसेत ।

The vaginal speculum or Diopter is mentioned by Soranus, Paul¹ and other Greek surgeons. Paul describes its method of working as follows:— “The person using the speculum should measure with a probe the depth of the woman’s vagina, lest the stalk (fistula) of the speculum being too long, it should happen that the uterus should be pressed upon. If it be ascertained that the stalk is larger than the vagina, folded compresses are to be laid on the alæ pudendi, in order that the speculum may be placed upon them. The stalk is to be introduced, having a screw at the upper part, and the speculum is to be held by the operator, but the screw is to be turned by the assistant, so that the laminæ of the stalk being separated, the vagina may be distended.” The accounts given by Albucasis² and Haly Abbas³ are similar. These instruments are described to be bivalve, trivalve or quadrivalve. A quadrivalve speculum of the Greeks is identical with the Joni-vranekṣana of the Hindus; the only difference being that the former is acted by screw mechanism, while the latter is worked on the principle of the lever. Drawings of several shorts of the Greek instruments are given in the surgery of Albucasis and by Schultet.⁴ There are three specimens of vaginal, speculum in the Naples museum, drawings of which are given by Milne. In modern times, we use similar valvular speculum for identical purposes.

¹ Paulus Ægineta, Vol. II. vi. lxxiii. Syd. Soc. Ed.

² Albucasis, Chirrug, II. 71.

³ Haly Abbas, Pract. ix. 57.

⁴ Arsenal de chirrug. tab. 18.

10. TUBULAR INSTRUMENTS FOR WOUNDS.

Vraṇa-vasti or Wound-syringe.

If the wound be caused by deranged air and be very tender, especially if it forms on the lower half of the body, the vasti should be used. In diseases of the urinary organs, such as, obstruction of urine, faulty conditions of urine, impure semen, stone in the bladder and disorders of menstruation, uttara-vasti is necessary.¹

There are two instruments mentioned—one for application of oleaginous medicines to a sore and the other for washing a sinus with medicated lotions. Each consists of a tube and a leather bag. The tube is smooth and rounded and is shaped like a cow's tail.² It is six anguli long. The base is broad and admits a thumb, while the end is narrow and admits a pea. There is a circular projection or ring at a short distance from the end. The base is fitted tightly into a bag of thin leather.³

¹ वातदुष्टो ब्रणीयस्तु रक्तायत्यवेदनः ।
अधःकाये विशेषेण तत्र वस्तिर्विधीयते ।
मूत्राघाते मूत्रदोषे गुकदोषेऽग्नरीत्रये ।
तथैवार्त्तवदोषे च वस्तिरप्युत्तरो हितः ॥

Suśruta Saṁhitā, IV. i.

² नाड़ी ब्रणानां स्त्रेहप्रयोगार्थं प्रचालनार्थं च इ यन्ते आह यन्ते इत्यादि नाड़ीब्रणाभ्यङ्गः चालनाय नाड़ीब्रणानामभ्यङ्गार्थं प्रचालनार्थं षडङ्गुले षडङ्गुल दीर्घे, वस्तियन्त्राकृति वस्ति-निवाकारि वृत्ते गोपुच्छाकारं

* * * *

Vāgbhaṭārtha Kaṇṇudi, I. xxv.

³ यन्ते नाड़ी ब्रणाभ्यङ्ग चालनाय षडङ्गुले ।
वस्तियन्त्राकृती मूलिङ्गुष्ठ कलायखे ।
अग्रतः कर्णिंकं मूलं निवङ्गस्तुचम्पणी ॥ १८ ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv

To prevent the tube slipping out of the bag, an additional precaution is taken by tying a knot of thread over the leather covering the tube. For description of the bag, *vide infra*.

Sārṅgadhara¹ however says that the tube should have the thickness of the shaft of a vulture's feather and should admit a moong (Phaseolus Moong). It is eight anguli long.

Pālakāpya describes the tube for washing wounds of elephants to be made of copper, and shaped like the karontaka flower. It is sixteen anguli long.

In modern times, wound syringes are similarly used to wash the sore with medicated lotions.

For description of the tubes for vraṇa-dhupana or wound-fumigation, *vide infra*.

11. TUBULAR INSTRUMENTS FOR ASCITES.

Dākodara yantra or Canula.

It may be either metallic or manufactured from the cylindrical hollow ealamus of a peacock's feather.² The tube is open at both ends and is of the same calibre throughout. Suśruta advises us to use a pipe of tin, or lead or a feather to drain the fluid, after the abdomen has been tapped.³

¹ त्रणवस्त्रे स्तु नेवं स्यात् श्वत्त्वाम एङ्गलो ग्निमतम् ।

मुङ्गच्छिद्रगृध्रपचनलिकापरिणाहि च ।

Sārṅgadhara Saṅgraha, III. vi.

² दिहारा नलिका पिञ्जनलिका वा दाकोदरे । १६ ।

Aṣṭāṅga Hṛdaya Saṅhitā, I. xxv.

³ तव वशादीनामन्यतमस्य नाडीद्विहारां पचनाडौं वा संयोज्या दोषोदक-भवसिच्चेत्तो नाडीमपहृत्य तैललवणेनाभज्य त्रणवस्त्रेनोपचरेत् ।

Suśruta Saṅhitā, IV. xiv

Celsus describes a lead or copper cannula for draining ascites.¹ Paul writes that the tip used to be bevelled off like a writing pen.² It was also employed in empyema.³ Albucasis⁴ mentions a tube of silver or copper or brass having a small hole at the bottom and three on its sides.

In modern times we use a metallic canula of similar shape for draining fluid in ascites.

12. TUBULAR INSTRUMENTS FOR HYDROCELE.

This is practically the same instrument described above. Suśruta⁵ mentions a tube or cannula to drain the fluid after tapping the hydrocele with the vrīhimukha śastra or trocar. The Greek surgeons did not describe the operation. They preferred the open incision to puncture.⁶ Rhases, however, describes the operation of puncturing the scrotum for hydrocele.⁷

13. TUBULAR INSTRUMENTS FOR URETHRAL STRICTURE.

Suśruta recommends gradual mechanical dilatation of the urethra by means of tubes made of iron, or wood, or lac, well-smeared

¹ Celsus, vii. 15 & ii. 10.

² Paulus Aegineta, Vol. II. VI. L. Syd. Soc. Ed.

³ Hippocrates, ii. 259.

⁴ Albucasis, Chirurg, ii. 54.

⁵ सूक्ष्मां स्वेदयित्वात् वस्त्रपट्टेन वेष्टयेत् ॥

सेवन्याः पार्श्वं तोऽधस्ता द्विधेन्द्रीहिसुखेन च ।

अथाव इमुखां नाड़ीं दत्ता विस्तावयेद् भिषक् ॥

Suśruta Saṁhitā, IV. xix.

⁶ Paulus Aegineta, VI. lxii.

⁷ Rhases, Cont. xxiv.

with ghee.¹ He advises us to use the same tube for three consecutive days, then another of larger calibre for three days more, and so on, till the canal be fully dilated. He reserves External Urethrotomy as a last resource.²

14. TUBULAR INSTRUMENTS FOR RECTAL STRICTURE.

Suśruta similarly describes gradual dilatation of stricture of the rectum, using a higher number of dilators after the lapse of three days until the desired effect is attained.³

¹ (a) निरुद्धप्रकाशि नाडौं लौहीमुभयतोसुखवौं ॥

दारवौ वा जतुक्तां षटाभ्यक्तां प्रवेशयेत् ।
परिषेक वसामच्च शिशुमारवराहयोः ॥
चक्रतैलं तथायोज्यं वातन्नप्रव्यसंयुतं ।
वाहाचाहात् स्थूलतरां सम्यड्नाडौं प्रवेशयेत् ॥
श्रीतोविवर्द्धयेद्वं सिंधमन्त्रच्च भोजयेत् ।
भित्वावा सेवनो मुक्तां सद्यःचतुर्वदाचरेत् ॥

Suśruta Saṁhitā, IV. xx.

(b) निरुद्ध प्रकाशि नाडौं द्विसुखवौम् कनकादिजम् ।

चिम्बाभक्ता चुम्लुकादिस्तेहेन परिषेचयेत् ।
तैलेन वा वचदारुकन्कैः सिङ्गेन च वाहात् ॥
पुनः स्थूलतरा नाडीदेया सोतोविवर्द्धये ।
...
... ... रुद्धगुद्देऽप्येष क्रियाक्रमः ॥

Cakradatta, Kṣudraroga Cikitsā.

See also Yogaratnākara, P. 368, where these verses are quoted.

² See I (a). अस्यार्थः—सेवनौ ल्यक्ता शस्त्रैण वा मूत्रस्रोतः संकोचकारणं च मविदारयेत् । तस्यापि द्वारस्याविपाटे मणिः अरमध्ये वं दारयेदिति ।

Commentary of Śrī Kauṭha in Vyākhyā Kusumāvalī
(Anandāśram Series), P. 406.

³ सत्रिरुद्ध गुदे योज्या निरुद्धप्रकाशक्रिया ॥

Suśruta Saṁhitā, IV. xx.

There is no mention of solid bladder sounds in the Sanskrit medical books. But from the above descriptions, it seems beyond doubt that they had a set of dilators for stricture of the urethra and another set of dilators for stricture of the rectum. These dilators were tubes—either metallic or wooden—and had a regular gradation in the increase of their diameters. Cakrapāṇī mentions stricture dilators of gold.¹

In modern times we have also two sets of these instruments—urethral and rectal dilators, numbered in an ascending series according to the increased diameters of these instruments.

15. TUBULAR INSTRUMENTS FOR INJECTIONS INTO THE RECTUM.

Vasti yantra or Rectal Clyster.

Injects into the rectum are to be thrown by means of a tube with a membranous bag tied to its end. The tube is advised to be made either of gold, or silver, or lead, or copper, or brass, or bell-metal, or ivory, or horns, or glass, or precious stones, or wood or bamboo. It should be clean, smooth, strong, and tapering like a cow's tail, and should terminate in a smooth rounded bulb. The tube varies in length and circumference according to the age of the patient as follows:—

I. Caraka.²

Age.	Length of tube.	Opening at the end admits.
6 years . . .	6 anguli . . .	A moong
12 " . . .	8 " . . .	A pea
20 " and over . . .	12 " . . .	A small plum seed

¹ See foot note I (b), Page 124.

² सुवर्णहृष्टप्रतामरीति

कांस्यायसास्थिद्रुमवेणुदन्तैः ।

नलिर्विषाणैर्मणिभित्य तेऽसौः

काश्याणि नेत्राणि मकर्णिकानि ॥

II. Suśruta.¹

Age.	Length of tube.	Part of tube in bag.	Circumference of tube.	Circumference at end.	Measure of injection.
1 year	6 aṅguli	1½ anguli	Little finger	Shaft of heron's feather.	2 añjali
8 "	8 "	2 "	4th "	Shaft of falcon's feather.	4 "
16 "	16 "	3½ "	3rd "	Shaft of peacock's feather.	8 "
50 "	12 "	3 "	Pulp of thumb	Admits a plum stone.	12 "
70 "	Same as that of the 16th year.				

षड् द्वादशाष्टाङ्गुल समितानि षड् विंशतिद्वादशवर्षजानाम् ।

सुमुद्रकर्कसु सतीनवाहिक्षिद्राणि वर्च्यापिहितानि चापि ॥

यथावयोऽङ्गुष्ठ कनिष्ठकाभ्यां मूलाग्योः स्युः परिणाहवन्ति ।

ऋग्नि गोपच्छसमाकृतीनिःश्वानि च सुर्गेडिकामुखानि ॥

स्वात् कर्णि कैकाय चतुर्थभागे मूलाग्यने वस्ति निवन्धने हे ।

जारङ्गवोमाहिषहारिणो वा स्याच्छौकरो वस्तिरञ्जस्य वापि ॥

दृढःसनुर्नष्टशिरो विगम्बः कषायरक्तः सुमृदृः सुशुद्धः ।

नृणां वयोवीक्ष्य यथानुरूपं नेत्रेषु योज्यस्तु सुवड्सूत्रः ॥

Caraka Saṁhitā, VIII. iii.

Also quoted in Cakradatta, Anuvaśanādhikāra.

१ तत्र सांवत् सरिकाष्टद्विरट् वर्षाणां षड् द्वादशाष्टाङ्गुल प्रमाणानि कनिष्ठिकानामिका मध्यमाङ्गुलि परिणाहान्यगेऽध्यज्ञाङ्गुलाई लृतीयाङ्गुल सन्निविष्ट कर्णिकानि कङ्गश्येन वर्हिपत्र नाड़ीतुल्य प्रवेशानि सुङ्गमाषकलायमाव स्वोतांसि विद्ध्यान्नेत्राणि तेषु त्वास्यापनादत्य प्रमाणमातुर हस्तसमितेन प्रसृतेन समितौ प्रसृतौ इच्छतागोऽस्तौ विधेयाः ।

भवति चात्र ।

वर्षीत्तरेषु नेत्राणां वस्तिमानसा चैव हि ।

वयोवल्लश्वीराणि समीक्षा वर्झयेदिधिं ॥

पञ्चविंशतिरुद्देश्याङ्गुलं द्वादशाष्टाङ्गुलं मूले ङ्गुष्ठोदर परिणाहमये कनिष्ठिकोदर परिणाहमये वाङ्गुल-सन्निविष्ट कर्णिकं गृध्रपत्रनाड़ीतुल्य प्रवेशं कोलास्थिमात्रं क्षिरद्रं क्षिरद्रकलायमात्रं क्षिरद्रमित्येकं । मर्ज्वानिमूले वस्तिनिवन्धनार्थं दिकर्णिकानि । आस्यापन दत्य प्रमाणं तु विहिता द्वादश प्रसृताः । मन्त्रनेत्रसूर्द्धं नेत्र प्रमाणमेतदेवदत्य प्रमाणन्तु द्विरक्षवर्षवत् ।

तत्र नेत्राणि सुवर्णरत्नतासयोरीति दलशङ्खमणितसुसारसयानि श्वानि दृढानि गोपच्छसमाकृतीन्यज्ञनि गटिका मुखानि । - वस्त्रयाश्वाहज्ञानां मृदवो नाति वहला दृढाः प्रमाणवन्तो गोमहिपवरगहाजोरभागाण ।

III. Vāgbhaṭa II.¹

Age. (years).	Length of tube.	Opening at base admits.	Opening at end admits.
Under 1	5 aṅguli	1 finger	A moong (phaseolus moong).
1 to 6	6 "	1½ "	A masha (phaseolous Rox.).
7 to 11	8 "	2 "	A kalāya (pea) (pisum sativum).
12 to 15	9 "	2½ "	Boiled pea.
16 to 20	12 "	3 "	A śīgalakoli (zizyphus cuneifolia).
over 20	varies according to the age, strength and size of the patient;		the orifice at the base of the tube need not be wider.

नेवलामि हितनाडौ नलवंशास्यि सम्भवा ।
 वस्त्रलामि हितं चर्मं सूक्ष्मं वा तान्त्रं घनम् ॥
 वस्त्रि निरूपदिग्धनु शुद्धं सुपरिमाजितं ।
 सद्बुद्धत हीनश्च सुहःस्ते हविमर्दितं ।
 नेवमूले प्रतिष्ठाप्य न्युञ्जन्तु विवताननम् ॥

Suśruta Saṁhitā, IV. xxxv.

१ तयोस्तु नेवं हेमादि धातु दार्ढःस्यि वेनुजं ।
 गोपुच्छाकारमच्छद्रं शक्त्वार्जु गुडिका सुखं ॥
 ऊनेऽच्छे पञ्चपूर्णे; मिद्रासपस्थोऽङ्गुलानि षट् ।
 मनसे सत तान्यष्टौ द्वादशे षोडशे नव ।
 द्वादशैव परं विशाद् वीक्ष्य वर्षान्तरेषु च ।
 वयो वल शरीराणि प्रमाणमभिवद्येत् ॥
 साङ्गेन समसूले स्थौल्येनाये कनिष्ठया ॥
 पूर्णेऽच्छे ऽङ्गुल मादाय तदडोर्धे प्रवदितं ।
 चाङ्गुलं परमं किद्रं सूलेऽये वहने तु यत् ।
 सुङ्गं भाषं कलायन्तु स्तिव्रं कर्कस्युकं क्रमात् ॥
 सूल चिद्र प्रमाणेन प्रान्ते घटित कण्ठिकं ।
 वर्त्याग पिहितं सूले यथास्वं डग्गुलालरं ।
 कण्ठिका दितयं नेवे कुर्यात् तत्र च योजयेत् ॥
 अजावि महिषादीनां वस्त्रं समदितं दृढं ।
 कपाय रक्तं निच्छिद्र गथ्यि गन्ध शिरं तनुं ।
 गथितं साधुस्वेण सुखं संस्थाप्य भेषजं ।
 वस्त्राऽभावेऽङ्गुलादं वा न्यसिद्धासोऽयवा घने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xix.

Cakradatta¹, Śāringadhara and Bhāva Miśra² follow Caraka as regards measurement. Kharanāda³ also gives a similar description.

¹ See foot note 2, Page 125.

२ नेवं कार्यं सुवर्णादिधातुभिवच्चवेणुभिः ।
नलैद्विन्नैर्विषाम्बागैर्मणिभिञ्चा विधीयते ॥
एकवर्षात् पङ्कवर्षं यावन्मानं पङ्कज्ञुलम् ।
ततो द्वादशकं यावन्मानं स्यादष्टसंमितम् ॥
ततः परं द्वादशभिरङ्गुलैर्नवदीर्घता ।
सुद्राक्षिद्रं कलायामं क्रिद्रं कोलास्थिसन्निभम् ॥
गोपुच्छसन्निभं मूले स्थूलं तस्मात् क्रमात् क्रशं ।
यथासंख्यं भवेन्नेवं श्वक्षणं गोपुच्छसन्निभम् ॥
आतुराङ्गुष्ठमानेन मूले स्थूलं विधीयते ।
कनौष्ठिकापरीणाहमगे च गुटिका सुखे ॥
तन्मूले कर्णिके हे च कार्यं भागाच्चतुर्थकात् ।
योजयेत् तत्र वस्तिच्च वन्धुद्यविधानतः ॥
सुगाजग्नकरगवां महिषस्यापि वा भवेत् ।
भूत्कोशस्त्र वस्तिस्तु तदलाभे च चर्मणः ॥
कवायरक्तः सुभट्टुवस्तिः स्त्रिघो दृढोहितः ।
ब्रणवस्तेस्तु नेवं सगात् श्वक्षणमष्टाङ्गुलोन्मितम् ॥
सुद्राक्षिद्रग्नधपक्षनलिकापरिणाहि च ।

Śāringadhara Samgraha, III. v.
Bhāva Prakāśa, I. ii.

³ वस्तिनेवमृजु शुक्रं सद्वृत्ताङ्गुलिकामुखम् ।
भवेन्नोपुच्छसंस्थानं सुप्रवाहं विकर्णिकम् ।
या विभागप्रणयने मर्यादा कर्णिका भवेत् ।
हे कर्णिके चोपरिष्टादस्त्राधारेऽथवान्तरे ।
साङ्गुष्ठकपरीणाहं मूलं नेत्रस्य शस्यते ।
मध्यं ल्वनामिकातुल्यमयं तुल्यकनिष्ठिकं ।
स्वे नाङ्गुलि प्रमाणेन दैर्घ्यं स्याद् द्वादशाङ्गुलम् ।
कर्णिकं धुप्रवहक्षिद्रं श्रेष्ठमन्यद्यथावयः ।

Hārīta¹ advises us to use a bamboo tube four aṅguli long, which is to be introduced into the reetum up to two aṅguli.

As a general rule, Caraka writes that the broad and the narrow ends of the tube are to be equal to the patient's thumb and little finger respectively, in circumference. The orifice at the end of the tube is to be kept closed by a wick, so that no foreign body may enter the lumen of the tube to oelude it. The plug may be easily removed when the tube is required for use, and then replaeed.

Towards the narrow end of the tube is a proection or ring at a distancee of about two aṅguli from the extremity. The height of the proection varies with the size of the tube at the base. It acts as a bar to the further introdnetion of the tube inside the reetum than required. Towards the base are two similar proections, two aṅguli apart from each other. To the one near the base is firmly tied the leather bag, so that the tube may not slip away suddenly during foreible compression of the bag. The other is meant to afford a firm grasp by the surgeon, so that the tube may not move during its introduction into the reetum. These proections are to be made of thread or a piece of cloth and are to be so shaped as to resemble the end of the proboseis of an elephant.

As regards the leather bags, they are recommended to be

विंशदादशप्रडवष्ट द्वादशाष्टप्रडङ्गुलम् ।

कर्कस्यूक सतीनागसुखं विद्रवहम् ॥

Kharanāda quoted in Sarvāṅga Sundarī, I. xix.

¹ चतुरङ्गुलां बेणुमयों नाडीं प्रतिलचणं कृत्वा लया वस्तिप्रतिकर्मं कुर्चात् । * * * गुदाभ्यन्तरे द्वाङ्गुलमावं नाडी मञ्चारंत्रैत् सुधीः ।

made of the bladder of cows, or buffaloes, or hogs, or goats, or lambs. The bladder is to be well cleaned first with lime and water, so that no unpleasant smell may be emitted by the decomposition of its muscular tissue, then dyed red with Mañjisthā (Rubia Cordifoliatum) or with Haritakī (Terminalia Chebula, Retz.) and thoroughly dried. The bags are recommended to be soft, durable, entire and capacious. If the bladders of these animals are not available, the bags are to be manufactured from a frog's skin, or the peritoneum (one-fourth part would suffice) of any beast, or a piece of leather or a piece of very thick cloth. The size of the bag varies according to the age of the patient. It is to be firmly tied over the first projection at the base of the tube.

In the Siddhīsthāna Chapter XI of the Caraka Saṁhitā,¹ there is a passage showing that veterinary medicine was well-known to the ancient Hindus at a very early period. This portion was edited by Dṛḍhavala and it is impossible to decide whether the passage refers to Agniveśatantra or not. It runs as follows:— “Then the disciples asked: ‘How are elysters to be made in cases of animals such as elephants, camels, cows, horses, lambs and goats?’ To this, the sage Ātreyā explained the elysters for

¹ अपृच्छदेनं सचवस्तिमवीत् विधिच्छतस्याह पुनः प्रचोदितः ।
अजाविकेसौम्य गजोद्धयोर्वा गवाश्वयोर्वस्तिसुशान्तिमाहिषम् ॥
अजाविकादन्मुवस्तिसुत्तरं वदन्ति वस्ति विपरौतरूपम् ।
मुवस्तिमष्टादशशोडशाङ्गुलं तथैवनेतत्तदशाङ्गुलं क्रमात् ॥
गजोद्धयोऽश्वाव्यजवस्ति सस्तौ चतुर्थभागे च सकर्णिकं वदेत् ।
प्रस्थस्त्वजात्योर्द्धि निरुहमावा गवादिषु विविग्यणो यथा वलम् ।
निरुह उद्धस्तथादकवयं गजस्य ब्रह्मस्त्वनुवासनेऽष्टमः ॥

animals in the following manner. The leather bag of the vasti-yantra should be made of a buffalo's bladder for goats, lambs, elephants, cows, camels and horses. The vasti for these animals is known as suvasti and uttara-vasti as uttara-suvasti. The tube of the suvasti should be eighteen aṅguli long for elephants and camels, sixteen aṅguli for eows and horses, and ten aṅguli for goats and lambs. Like the vasti yantra used for men, it should have a projection at the junetion (of the tube with the bladder) and another at the fourth division of the tube from the end."

In the Aśvavaidyaka¹ the tube for the horse is thus deseribed : "The tube should be made either of wood, or metals, or horn, or bamboo, or reeds. Its length should be twelve aṅguli and circumference six aṅguli. The wise surgeon should make the tube of such a ealibre as to allow a plum seed to pass through it easily. It should be straight, polished and tapering from the base. At a distanee of four aṅguli from the end of the tube, a projeetion should be raised, while for tying the leather bag firmly to the tube, two projeetions ought to be eonstrueted at the base".

Pālakāpya² deseribes the rectal elysters for elephants. He advises that these are to be made either of wood or bamboo. The end is bulbous and the surface smooth. The length

¹ काष्टैर्दण्डरयोभिश्च शङ्खवंशनलादिभिः ।

इदमगाङ्गुलीदीर्घन्तु परिणाहे षड्ङुलम् ॥

कोलास्थिमावच्छिद्रन्तु कुर्यान्निवं विचचणः ।

मूलादनुक्रमं श्वस्त्रमसृणन्तु विशेषतः ॥

व्यक्ताङ्गुलानि चत्वारि कर्णिकालस्य कारयेत् ।

पुटकस्यप्रवन्धाय मूले द्वे चापि कर्णिके ॥

Aśvavaidyaka, XVI. vs. 2—4.

² Pālakāpya's Hasti-Āyurveda, Sec. IV. Ch. V.

length of the tube varies, the most convenient being sixteen aṅguli for men and sixty-eight aṅguli for elephants. The projections at the base of the tube should be twelve aṅguli high. He describes in detail the method of introduction, position of the elephant, etc.

Dṛḍhavala advises us to reject the following eight kinds of tubes and eight kinds of bags¹ :—

I. Tubes—

1. Hrasva or too short: For the injection does not reach the proper place.
2. Dirgha or too long: For the injection passes beyond the proper place.
3. Tanu or too thin: The injection can not pass through the tube easily and so the bag may burst.
4. Sthūla or too thick: The tube pulls the mucous membrane of the rectum and anus backwards and forwards during its entrance and exit.
5. Jirṇa or old, weak and delicate: The tube may break inside the rectum during its introduction and so cause injury to the gut or anus.

¹ ऋस्त् दीर्घं तनुस्थूलं जीर्णं शिथिलवन्धनम् ।
पार्श्चक्षिद्रं तथा वक्रमष्टौ नेवाणि वर्जयेत् ॥
अप्राप्तातिगतिचोभकर्षणचणनस्वाः ।
गुदपीडा गतिजिङ्गा तेषां दोषा यथाक्रमम् ॥
मांसलच्छिद्रविषमस्थूलजालकवातलाः ।
क्षिन्नः क्षिन्नश्च तानष्टौ वस्तीन् कर्मसु वर्जयेत् ॥
गतिवैप्यविस्तत्वाव्यदौग्राह्यनिस्वाः ।
फिनिलच्छृतधार्यत्वं वस्ते: स्याद् वस्तिदोषतः ॥

6. Śithilabandhana : The tubes do not fit the bags well, so during compression of the bags, the injected fluid runs out by the side of the tube.
7. Pārśvacchidra or leaky : Having slit on the side, the tube may injure the soft parts by rubbing against them.
8. Bakra or curved : The motion of the injected fluid would be curvilinear. It will strike a side of the rectum and so would not go inside the gut.

II. Bags—

1. Mainsala or fleshy : The bag emits bad smell.
2. Chidra or leaky : The injection escapes outside.
3. Viṣama or uneven : Parts are unequally compressed and so the injection does not issue in a forcible jet.
4. Sthūla or thick : It is difficult to grasp the bag and so it can not be forcibly compressed.
5. Jālaka or having a network : The injection comes out.
6. Vātala or hollow, airy and incompressible : If air can not be expelled out, froth forms in the injection ; and so air is pumped into the rectum.
7. Chinna or torn : The injection flows down.
8. Klinna or moist : The injection can not be forced out.

Suśruta mentions eleven defects of tubes and five defects of bags of the Vasti yantra.¹

¹ अतिष्युलं कर्कशमवनतमणुभिन्नं सन्निकृष्टं विप्रकृष्टं कर्णिकं सूच्चातिच्छ्रद्रमतिदीर्घं मतिहस्तमिलेकादशं नेवदोषाः । वह्नतात्यता सच्छ्रद्रता प्रसीर्णता दुर्बिङ्गतति पञ्चवस्ति दोषाः ।

I. Tubes—

1. Atisthūla : Too thick. } Such tubes injure the rectum and so cause pain.
 2. Karkaśa : Rough. }
 3. Avanata : Curved. }
 4. Anu : Too thin. } It becomes useless to inject
 5. Bhinna : Broken. } fluids into the rectum.
 6. Sannikṛṣṭa Karṇika : Projection near? }
 7. Viprakṛṣṭa Karṇika : Projection distant? } Injure the rectum which bleeds.
 8. Sūkṣma : Small orifice. } It becomes difficult to inject
 9. Atihrasva : Too short. } as the fluid comes out.
 10. Atichidra : Large orifice. } Too much fluid passes into the rectum and so pain is
 11. Atidīrgha : Too long. } complained of.

II. Bags—

1. Vahalatā : Fleshy. } It is difficult to tie the bags
 2. Prastīrṇatā : Large. } over the tubes properly.
 3. Saechidratā : Perforated. } No fluid can be forced
 4. Durvviddhatā : Difficult to tie. } into the rectum and so the instrument is useless.
 5. Alpatā : Small. Small quantity of fluid passes into the rectum.

गुदे भवेत् चतं रक्तं च साधनं पूर्ववत् स्मृतं ।

आसन्न कर्णिं के नेवे भिन्नेऽणौ वायपार्थं कः ॥

अवसेको भवेद्दस्तस्मादोषान्विवर्जयेत् ।

प्रक्षेप कर्णिं के रक्तं गुदमर्थं प्रपीडनात् ॥

चरत्यवापि पित्तधो विधिर्वल्लिश्च पिच्छिलः ।

ज्ञस्वेत्वण्सोतसि च क्लैशो वस्तिश्च पूर्ववत् ॥

प्रत्यागच्छंस्तः कुर्याद्दोगान्वस्ति विघातजान् ।

दीर्घे महास्तोतसि च ज्ञेयमत्यवपौङ्गवत् ॥

प्रस्तीर्णे वहले चापि वस्तौ दुर्बले दीषवत् ।

वस्तावल्पेऽल्पता वापि द्रव्यस्याल्पगुना मताः ॥

दुर्विहं चाणु भिन्ने च विज्ञेयः भिन्ने निववत् ।

16. UTTARA-VASTI.

Urethral, Vaginal and Uterine Tubes.

Injections into the urethra and vagina are also recommended to be thrown in by similar contrivances : the tubes being adopted in length and circumference to the length and breadth of the passages for which they are intended.

1. Tubular Instruments for the Urethra.

The tubes intended for applying medicines into the male urethra is recommended to be twelve aṅguli long. Suśruta¹ advises us to use tubes fourteen aṅguli long. It is to be made of gold and is called Puṣpanetra. Its circumference is equal to that of a stalk of flower of Jātī (Jasmimum Grandiflorum) or Mālatī (Echites Crayophyllata, Rox.), and the lumen of the tube allows a mustard seed to pass through it. It is provided with an annular projection just at the central part. Caraka² says that

¹ वस्त्रक्तरसज्जस्यविधिं वच्चाम्यतःपरं ॥
 चतुर्दशाङ्गुलं नेत्रमातुराङ्गुलं सम्मितम् ।
 मालतीपुष्पवृत्तायां शिद्रं सर्षपं निर्गमम् ॥
 मेद्रायामसमं केचिदिच्छन्ति खलु तद्विदः ।
 स्त्रेहं प्रभाणं परमं कुञ्जश्वावं प्रकीचितः ॥
 पञ्चविंशादधोमादां विदध्याद् दुष्क्रिकल्पिताम् ।
 निविष्टकर्णिकं मध्ये नारीणां चतुरङ्गुले ॥
 मूवस्त्रोतः परीणाहं सुह्र वा हि दशाङ्गुलं ।
 तासामपत्यमार्गं तु निदध्याचतुरङ्गुलम् ॥
 ह्याङ्गुलं मूवमार्गं तु कन्यानां त्वेकमङ्गुलम् ।
 विधिव्रं चाङ्गुलं तासां विधिवद्यात् यथा ॥

Suśruta Saṁhitā, IV. xxxvii.

² पुष्पगेतवञ्च हैमं स्यात् मूजामौत्तरवस्त्रिकम् ।

it has two projections while Vāgbhāṭa¹ describes three. The bag is to be made of goat's bladder. A probe is first passed into the urethra to examine its condition and then the tube is introduced up to the length of six aṅguli. The bladder which contains the injection and which is tied tightly round the tube, is then compressed to force the fluid into the urethra. The tube of course, varies in size according to the dimensions of the organs of generation.

For the female, the puspanetra is described to have the length of ten aṅguli. The projection is at a distance of four aṅguli from the base. The circumference of the tube varies according to the width of the urethral canal. The calibre of the tube allows a moong to pass through it.²

जातीपुष्पस्य वृन्तेन समं गोपुच्छसम्मितम् ।

रौथं वा सर्वपक्षिद्रं द्विकर्णं द्वादशाङ्गुलम् ॥ ४६ ॥

Caraka Saṁhitā, VIII, ix.

¹ आतुराङ्गुलमानेन तत्र व' द्वादशाङ्गुलं ।

वृत्तं गोपुच्छवत् मूल मध्ययोः क्लत कर्णिक' :

सिद्धार्थक प्रवेशायं शूक्ष्मा हेमादि सम्बवं ।

कुन्दाश्वमार सुमनः पुष्पवृन्तोपमं ददृः ।

तस्य वस्त्रिर्दुलघुर्मावा शुक्रिविकल्प्य वा ॥

* * * *

नेत्रं द्वादशाङ्गुलं सुहङ्गप्रवेशचतुराङ्गुलं ।

अपत्यमार्गं योज्यं स्याद्वादशाङ्गुलं मूत्रवर्त्मनि ॥

मूत्रक्रक्षविकारिष्य वालाना स्तेकमङ्गुलम् ।

Aṣṭāṅga Hṛdaya Saṁhitā, I, xix.

² पुष्पनेत्र प्रमाणन्तु प्रमदानां द्वादशाङ्गुलम् ।

मूत्रस्नोतः परीणाहं मूत्रस्नोतोऽनुवाहि च ॥

गर्भमार्गं तु नारीणां विषेयं चतुराङ्गुलम् ।

इत्याङ्गुलं मूत्रमार्गं त वालाया मूत्रे कमङ्गुलम् ॥

Caraka Saṁhitā, VIII, ix

Catheters.

It is curious to find no description of so important an instrument as the eatheter. Injections were thrown into the urethra but the tube used was always a straight one, having the length of six anguli; so it could not possibly have reached the bladder in the male, and nowhere has the claim been put forward for it to have done so. The tube might have served well for the females. The female eatheter of the Greeks, as preserved in the Naples museum, is 0·98 mm. long and is straight throughout (Milne).

In the Atharvaveda Samhitā,¹ however, we find a hymn, unmistakably alluding to the use of eatheter in ancient times.

Against obstruction of urine with a rod.

"This hymn is intended to be 'used in a rite for regulating the flow of urine'. The reed implies some primitive form of a fistual urinaria, the vastiyantra (one of the nādīyantrāni) of the late physicians—who however do not appear to have made frequent uses of it".

* * * * *

6. What in thine entrails, thy (two) groins, what in thy bladder has flowed together—so be thy urine released, out of thee with a splash! all of it. (In the groin are two vessels located in the two sides affording access to the receptacle of urine).

7. I split up thy urinator, like the weir of a tank—so be thy urine released, out of thee, with a splash! all of it.

8. Unfastened (be) thy bladder orifice, like that of a water-

¹ Book 1. 3. Whitney's translations and annotations.

holding sea—so be thy urine released, out of thee, with a splash ! all of it.

9. As the arrow flew forth, let loose from the bow,—so be thy urine released, out of thee with a splash ! all of it”.

2. Tubular Instruments for the Vagina.

Similarly injections were thrown into the vagina. The vaginal tube should be thicker than the urethral tube and in circumference should be equal to that of the little finger. It should be introduced into the vaginal canal up to a distance of four aṅguli, whereas into the urethra, the tube was allowed to enter up to a distance of two aṅguli only in the adults and of one aṅguli only in the girls.¹

3. The Uterine Tubes.

The uttara-vasti comprises the urethral syringe—male and female—and the vaginal and uterine clysters. No distinct uterine tube is described in the text books. But Suśruta² says

¹ द्वादशङ्कुलकं नेत्रं मध्ये च कृतकर्णिकम् ।

मालतिपुष्पवृत्ताभञ्जिद्रं सर्षपनिर्गमम् ॥

* * * *

स्त्रीणां कनिष्ठिकास्थूलं नेत्रं कुर्याद्वादशङ्कुलम् ।

सुद्धप्रवेश्य योज्यच्च योन्यन्तश्चतरङ्गुलम् ॥

द्वादशङ्कुलं सूवमार्गं च सूज्मं नेत्रं नियोजयेत् ।

मूत्रकञ्जिकारेषु वालानामेकमङ्गुलम् ॥

Sāringadhara Saṁhitā, III. vii.

Bhāva Prakāśa, I. ii.

² उद्धुजात्वै स्त्रियै दद्यदुत्तानायै विचक्षणः ।

कत्पतरस्य करण्यायै दद्यात् सुमदु पौडितं ।

तिकर्णिकेन नेत्रेन दद्यायोनिसुखं प्रति ।

गर्भाशय विशुद्धार्थं स्त्रेहेन द्विगुणेन तु ।

अप्रत्यागच्छति भिषक् वस्त्रावृत्तरसंचिते ।

that to apply uttara-vasti to a female, she is advised to lie supine, keeping her knees flexed and well raised. For a girl the quantity of injection is one prasṛta.

To purify the uterine cavity, apply a clyster of twice the quantity of oleaginous medicines, inside the vagina by means of a tube having three rings. If after the application, the oily medicine does not flow out, then apply a second clyster containing medicines of the group called śodhana or purifiers, into the rectum; or let the clever surgeon introduce a probe into the space of the clyster; or press under her navel deeply by his closed fist. As the object of the injection is to clean the cavity of the uterus, there can be no doubt that a uterine tube is referred to in the passage. Again the precautions recommended if the injections do not come back easily, point to a uterine tube to have been used, for injections into the vagina can not be delayed in coming out. The Hindu writers often confounded the intra-uterine and urethral injections with the vaginal clyster. Caraka¹ says: "The uttra-vasti is to be used for the females during the period of menstruation, for then the uterus, being in a condition fit for impregnation, has its mouth open and so can easily be reached by the injection." This shows that uterine medication to be the object aimed at by the clyster.

भूयो वस्ति॑ विद्ध्यातु संयुक्तं शोधनैर्गणैः ।
गुदे वर्ति॒ निद्ध्यादा शोधनद्रव्यं संभृतां ।
प्रवेशादा मतिमान्वस्तिदारमथैषणीम् ।
पीड्येवाद्यधोनभिर्लिनोत्तरसुषिना ।

Suśruta Saṃhitā, IV. xxxvii

¹ स्त्रीणाच्चार्तवकाले तु प्रतिकर्म तदाचरेत् ।

गर्भसना सुखं स्त्रीहं तदादने ह्यपाप्रता ॥

गर्भं योनिस्तदा श्रीमं जिने गङ्गाति मारुते ॥

The Greeks were no better, for Milne also complains : "It is difficult to separate ancient descriptions of injections into the vagina from those into the uterus, for the terms for the two parts are frequently interchangeable". Again he says : "It is probable that at other times under the heading of 'injections of the bladder', only irrigation of the urethra is meant".¹

18. TUBULAR INSTRUMENTS FOR INHALATIONS AND FUMIGATIONS.

The tubes for smoking were made, like the vasti tubes, of various metals, or glass or wood. Caraka² describes it as a straight tube having three pouches. The end of the tube is equal in diameter to that of a plum seed. Śāringadhara³ adds that a reed or bamboo pipe will also serve the purpose. It is described as a straight tube, the broad base of which admits the patient's thumb while the narrow end, a plum seed. Suśruta⁴ describes the base

¹ Graeco-Roman Surgical Instruments, P. 107-8.

² चतुर्भिंशतिकं नेत्रं स्वङ्गलीभिर्विरचने ।
दातिंशदङ्गुलं स्मैहे प्रयोगे चार्द्धमिथ्यते ॥
कर्जुविकोषफलितं कोलास्यग्रप्रमाणितम् ।
वस्तिनेत्रं समद्रव्यं धूमनेत्रं प्रशस्यते ॥१६

Caraka Samhitā, I. v.

³ धूमनाडी भवेत्तत्र विखण्डा च विपर्विका ॥१०
कनीष्ठिका परीणाहा राजमाषागमाल्तरा ।
धूमनाडी भवेद्वैधर्या शमने रोगिणोऽङ्गुलैः ॥११
चत्वारिंशन्मितैस्तद्वृत्विंशङ्गिष्ठौ स्मृता ।
तीक्ष्णे चतुर्विंशतिभिः कासघे षोडशोन्मितेः ॥१२
दशाङ्गुलिवर्वामनीये तथासप्ताद्वरणनाडिका ।
कलायमरुलस्यूला कुलत्यागमरन्ध्रका ॥ १३

Śāringadhara Samhitā, III. ix.

⁴ तत्र वस्तिनेत्रद्रव्यैधूमनेत्रद्रव्याणि व्याख्यातानि भवन्ति । धूमनेत्रस्तु कनिष्ठिका परिणाहमये कलायमादं सोतोमूलेऽङ्गुष्ठपरिणाहं धूमवर्त्ति प्रवेश सोतोऽङ्गुलान्यष्ट चत्वारिंशर् प्रायोगिकि । दातिंशत् स्मैहने । चतुर्भिंशतिर्वैरचने । षोडशाङ्गुलं कासघे वामनीये च ।

and end of the tube to be equal in circumference to that of the thumb and little finger respectively. The orifice should allow a common pea to pass easily through the tube. Vāgbhaṭa¹ says that there are three pouches or dilatations of the tube, shaped like the half-open buds at equal distances from each other. The tube is supposed to consist of four equal parts. The first pouch is located at the end of the first part, the second and third pouches at the ends of the second and third parts respectively. Cakradatta² also describes it similarly.

Dṛḍhabala³ mentions another method of inhalation. He makes a paste of the medicines prescribed and smears it on a piece of silk cloth. This is then to be rolled round like a wick. This wick is to be dipped in ghee before use, and fire lit at one end, while the patient is to smoke it through the other end.

एते अपि कोलास्थिमाव च्छिद्रे भवतः । ब्रणनेवमस्ताङ्गुलं ब्रणधूपनार्थं कलायपरिमण्डुलं
कुलायथवाहि स्रोत इति ।

Suśruta Saṁhitā, IV. xl.

¹ वस्ति नेत्र सम द्रव्यं विकीर्षं कारयेद्गु ।

मूला, ग्रेह्णुष्ट कोलास्थि प्रवेशं धूमनेत्रं ।

तौच्छ चेह्न मध्येषु वीणि चत्वारि पञ्च च ।

अङ्गुलीनां क्रमात् पातुः प्रमाणे नाष्टकानि तत् ॥६॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxi.

² ऋजुचिकोषफलितं कोलास्थगप्रमाणितम् ।

वस्तिनेवसमद्रव्यं धूमनेत्रं प्रशस्ताने ।

माईम्बन्धयुतः पूर्णोहस्तं प्रायोगिकादिषु ।

नेत्रे कासहरे लंशहीनः शेषे दशाङ्गुलः ॥

Cakradatta, Dhūmapānādhikāra.

³ प्रपुड्डरीकं मधुकं शाङ्गं द्वां समनःशिलाम् ।

सरिचं पिपलीं द्राचामेलां सुरसमञ्जरीम् ॥

कत्वा वर्त्ति पिवेऽमूर्मं चौमचेलानुवर्त्तिं ताम् ।

घृताक्रामनु च चौरं गुडोदकमथापिवा ॥

Caraka Saṁhitā, VI. xxii,

Both Caraka¹ and Śāriṅgadhara² advise us to make tubes of medicines, the fumes of which are advised to be smoked in the following manner:—Powder the medicaments and make a paste; measure one karsa; take a smooth reed (*Saccharum sara*, Rox.) twelve aṅguli long. Apply the paste round the reed, for a length of eight aṅguli. Dry it in shade. Remove the reed, leaving a dried tube of the paste. When required for smoking, light one end of the tube with a burning wick and smoke through the other end.

Caraka³ describes another inhaler, which consists of two earthen basins (*soraba*) placed upon each other, their edges being pasted with flour. The upper one is perforated at the centre for the reception of one end of the tube, the patient puts the other

¹ पिष्टा लिम्पेच्छरेष्टोकां तां वर्त्ति यवसन्निभां ।

अङ्गुष्ठसम्मितां कुर्यादिष्टाङ्गुलसमां भिषक् ॥

शुष्कां निर्गर्भां तां वर्त्ति धूमनेवार्पितां नरः ।

स्त्रेहाक्तमग्निसंङ्घटां पिवेत् प्रायोगिकीं सुखाम् ॥ ६ ॥

Caraka Samhitā, I. v.

² अथेषिकां प्रत्येष्व मुश्शक्षणं हादशाङ्गुलाम् ।

धूमद्रव्यस्य कल्के न लिपश्चाष्टाङ्गुलः स्मृतः ॥

कल्कं कर्षभितं लिप्ता क्वाया शुष्कच्च कारयेत् ।

इषिकामपनीयाय स्त्रेहाकां वर्त्तिमादरात् ॥

अङ्गारैर्दीपितां क्लत्वा धूत्वा नेवस्य रम्भके ।

वदनेन पिवेङ्गुम् वदनेनैव संत्वजित् ॥.

नासिकाभ्यां ततः पौत्रा सुखिनैव वमेत् सुधीः ।

Śāriṅgadhara Saṅgraha, III. ix.

³ मधुच्छिष्टं सर्जरसं घृतं सप्तकसंपुटे ।

क्लत्वा धूमं पिवेच्छृङ्गं वालं वा स्त्राय वा गवाम् ॥

श्वोग्नाकवर्षमानानां नाडीं शुष्कां कुशस्त्र वा ।

Caraka Samhitā, VI. xxi.

end into his mouth for inhalation. The lower pot contains glowing charcoal of catechu (*Acacia catechu*. Linn.) wood, over which are put pills of necessary medicines. The tube is from eight to ten anguli long.¹ This inhaler is intended for phthisical subjects. It is useful for allaying cough and exciting emesis. This instrument is called *mallaka sampūṭa* or *sorāba sampūṭa* or a pair of earthen basins. In such an apparatus Caraka recommends us to put powders of cow's horn, hairs, nerves and ligaments, besides other medicines. Susruta², Vāgbhāṭa³ and Cakradatta⁴ also describe it. Śāringadhara⁵ however reserves this instrument for fumigating wounds only.

The length of the pipe will vary according to the different kinds of smoking prescribed by the physician. There are five kinds of smoking narrated :—

1. Śamana, madhya, proyogika — medium.
2. Brīnhana, snēhana, mṛdu — mild.

¹ दशाङ्गुलोग्नितां नाडौ अथवाष्टाङ्गुलोग्निताम् ।

श्रावसंपुटच्छिद्रे क्लवा जिह्वां विचक्षणः ॥

वैरीचनं सुखिनैव कासवान् धूमसापिवेत् ।

Caraka Samhitā, VI. xxii.

² इतरयोर्व्यपेत धूमोङ्गार स्थिरे समाहिते शरावे प्रत्यिष्ठ वर्त्ति मूलच्छिद्रेणान्येन शरावेण पिधाय तस्मिन्च्छिद्रे नेत्रमूलं संयोज्य धूमसापेवेत् ।

Suśruta Samhitā, IV. xl.

³ श्राव सम्पुटच्छिद्रे नाडौ व्यस्य दशाङ्गुलां ।

अष्टाङ्गुलां वा वक्त्रेण कासवान् धूमसापिवेत् ॥

Astāṅga Hṛdaya Samhitā I. xxi.

⁴ अथवा सघृतान् शक्तून् क्लवा मङ्ग्लिकासम्पूटे ।

नवप्रतिश्यायवतां धूमं वैद्यः प्रयोजयेत् ॥

Cakradatta, Nāsāroga Cikitsā,

⁵ See foot-note 2, P. 145.

3.	Recana, śodhana, tīkṣṇa	—	strong.
4.	Kāsaghna	—	anti-cough.
5.	Vāmana	—	emetic.

So the length of the tube would vary thus—

1. Caraka¹

			Āṅguli.
In strong smoking	...	...	... 24
„ medium „	...	...	... 32
„ mild „	...	...	... 96

2. Suśruta.²

In medium smoking	...	...	... 48
„ oleaginous „	...	...	... 32
„ brain-sedative „	...	...	... 24
„ anti-cough or emetic „	...	...	... 16

3. Vāgbhāṭa.³

In strong smoking	...	...	... 24
„ medium „	...	...	... 32
„ mild „	...	...	... 40

4. Śārṅgadhara.⁴

In medium smoking	...	...	... 40
„ mild „	...	...	... 32
„ strong „	...	...	... 24
„ anti-cough „	...	...	... 16
„ emetic or wound-fumigation	...	...	... 10

FUMIGATION.

Similarly wounds are said to be purified by suitable medicinal fumigation. In the purification of wounds by fumigation, we get a glimpse of the antiseptic method of treatment in its

¹ See foot-note 2- P. 140.

³ See foot-note 1. P. 141.

² See foot-note 4. P. 140.

⁴ See foot-note 3. P. 140.

embroyonic form. Suśruta¹ recommends the tube to be eight anguli long and to have the circumference of a common pea; and its orifice should be of the size of a kulattha (*Dolichos biflorus*, Linn.). The fumes of medicated substances from the inside of any closed pot containing fire, pass out through the tube and are allowed to play on any sore to purify it. For this purpose two earthen pots—sorāba sampūṭa—may conveniently be used as before. Śāringadhara² uses a tube ten anguli long and recommends us to use Nimba leaves (*Azadirachta Indica*) for wound-fumigation. As another instance of the application of the principles of antiseptic methods to practical therapeutics, we may mention the use of medicinal injections into the cavity of the uterus to rectify its morbid conditions.³

A similar instrument was used to fumigate the uterus and vagina in various diseases of these parts. “Fumigation”, says Suśruta,⁴ “is to be applied to the vagina by burning the

¹ त्रणनेवमटाङ्गुले त्रणधूपनार्थमकलायपरिमण्डलं कुलत्यवाहिस्तीतिः ।

Suśruta Saṃhitā, IV. xl.

स चौमयवसर्पिभिर्धुपनाङ्गैश्चधूपयेत् ।

Ibid., IV. i.

² दशाङ्गुलिर्वामनीये तथासग्राद् त्रणनाडिका ।

कलाय मण्डलस्थूला कुलत्यागमरन्धुका ॥१३

* * *

शरावसम्पुटे निष्ठा कल्कमङ्गारदीपितम् ॥१७

क्षिद्रे नैव निवेश्याय त्रणन्तेनैव धूपयेत् ।

* * *

त्रणे निष्ववचायन्न धूपनं संप्रशस्यते ।

Śāringadhara Saṃgraha, III. ix.

³ See foot note 2, P. 1318.

⁴ सर्भसङ्गे तु योगिं धूपयेत् क्षणसर्पनिमोक्तेण पिण्डीतकेनवा ।

Suśruta Saṃhitā, III. x.

slough of a snake (Bungarus) or pinditaka (?) wood, in cases of obstructed delivery of the foetus. Caraka¹ mentions fumigation of the vagina by burning Bhurjapatra (Betula Bhojpatra), glass, precious stones and the slough of a snake as one of the means for removing the placenta. To remove the after pains and difficulty in micturition and defaecation, Suśruta² advises us to fumigate the vagina. He recommends fumigation of the uterus with purifying medicines. In fumigating these parts, the Hindu surgeons desired a local action, and did not share in the belief, held by some of the Greek gynaecologists³ that "the uterus was an animal within the body which could wander about, being attracted by pleasant smells and repelled by disagreeable smells".⁴ The Arabs also did not believe uterus to be an animal. This method of treatment was well known to the Greeks; for Hippocrates⁵ writes that "fumigation with aromatics promotes menstruation and would be useful in many other cases, if it did not occasion heaviness of the head". He "directs us to take a vessel which holds about four gallons and fit a lid to it so that no vapour can escape from it. Pierce a hole in the lid, and into this aperture force a reed about a cubit in length so that the vapour cannot escape along the outside of

¹ भूर्जपत्रकाचमणि सर्पनिम्बोक्तैश्वासारा योग्यं धूपयेत् ।

Caraka Saṃhitā, IV. viii.

² कटुकालावृक्तवेधन सर्षप सर्पनिम्बोक्तैर्वा कटुतैलविमिश्यैर्योनिमुखं धूपयेत् ।

Suśruta Saṃhitā, III. x.

³ Aretaeus, Morb. Acut. ii. II.
Plato's Timeas.

⁴ Graeco-Roman Surgical Instruments, P. 158.
Adam's Commentary on Paulus Aegineta, Vol. I. Bk. ii. P. 636-37.

⁵ See also in the Hippocratic treatises, as Nat. Mul. vii, 9; 1 Morb. Mul. xvii. 1; II Morb. Mul. xl, 20, 21; Steril. vi. 3; Superfet. ix. 3, 2. 9, 11.

the reed. The cover is then fixed on the vessel with clay.”¹ Oribasius² and Soranus³ used similar instruments for the purpose.

DISINFECTION OF ROOMS, CLOTHES, etc.

Caraka⁴ says that if peacock’s feather, bones of vaka bird, white mustard and red sandal wood, well powdered and mixed with ghee, be used in fumigation, the poison of a room, beddings, seats and clothes, is got rid of. Śāringadhara⁵ advises us to disinfect a sick room by the fumes caused by burning the following substances with ghee : peacock’s feather, Nim leaves (Melia Azadirachta), Vrihati, pepper, asafoetida, Jotāmāīnsī (Nardostachys jatamansi), seeds of Sālmalī (Bombax malabaricum), goat’s hair, slough of a serpent, cat’s faeces and ivory. Suśruta⁶ advises fumigation of a sick room for a surgical patient for

¹ Graeco-Roman Surgical Instruments P. 159.

² Coll. x.xix.

³ Soranus. xxiii.

⁴ शिखिवर्हवलाकास्थीनि सर्पपाशदने च घृतयुक्तः ।
धूमो गृहश्यनासनवस्त्रादिषु शस्यते विषनुत् ॥५६॥

Caraka Saṁhitā, VI. xxv.

⁵ मयूरपिच्छं निम्बसर्प पवाणि वृहतीफलम् ।
मरिचं हिङ्गु मांसी च वौजं कार्पाससञ्चवम् ॥
क्षागरोमाहिनिर्मीकं विष्ठा वैडालिकी तथा ।
गजदनश्च तच्चूर्णं किञ्चिहृतं विमिश्रितम् ।
गेहेषु धूपनं इत्यं सर्वन्वालयहाञ्जयेत् ।
पिशाचान् राक्षासञ्जिता सर्वज्जरहरो भवेत् ॥

Śāringadhara Saṅgraha, III. ix.

⁶ सर्पपारिष्टपवाभ्यां सर्पिषा लवणेन च ।
दिरन्ह कारयेद्धूपं दशरात्रमन्द्रितः ॥

Suśruta Saṁhitā, I. xix.

ten days, morning and evening, after the operation has been performed.

15. TUBULAR INSTRUMENT FOR CUPPING.

Generally cow's horn is recommended for the purpose. It is eighteen aṅguli long, its base, forming the mouth of the instrument, is three aṅguli wide (*Vāgbhaṭa*).¹ It is conical in shape and the cone is said to be either curved or straight. The other end is pointed and perforated to the extent of allowing a mustard seed to pass through it. The narrow end, however, is made to assume the shape of a woman's nipple by winding thread round it. This facilitates the operation of suction by the mouth of a surgeon when the broad end is placed against any diseased area of the patient's body. Suśruta² mentions its use in blood-extraction. For extracting blood, the part must be scarified before its application; and to facilitate the operation, the part should be fomented (*Yogaratnākara*).³ After suction, the horn is to be covered by a piece of cloth or a small bladder of animals.

Vāllūki⁴ describes the śringa thus:—"It is the horn of a white cow, half-moon shaped and seven aṅguli broad. The orifice

¹ वाहूलासंग भवेच्छुद्धं चूषणेऽदशाङ्कुलं ।

अयसिद्धार्थकच्छिद्रं सुनम्बुचुकाकृति ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² तवप्रच्छिते तनुवस्त्रपटलावनहेन शङ्खेन शोणितमवसेचयेदाचूषणात् ।

Suśruta Saṁhitā, I. xiii.

³ स्वे दं विदध्यात्कुशलश्च नाद्या शङ्खेन रक्तं वहुशः हरेच ।

Yogaratnākara Arbuda cikitsā.

⁴ विषाणः श्वेतगोरिन्दूचक्रं सप्ताङ्कुलायतम् ।

निमान्तः पितृपेशिकां योज्य वातयुतेऽस्ति ।

अङ्गुष्ठे मूलवन्मूले क्षिद्रमगेऽसरा मुङ्गवत् ।

Vāllūki quoted in Nibandha Saṁgraha, I. xiii.

at the base is equal in circumference to that of the base of the thumb, while the end which is perforated admits a moong. This orifice at the end is closed by a wick of cotton". Cakra-pānidatta says that the horn should be three aṅguli long, and its orifice should be of the size of the stalk of an oleander flower.

Suśruta mentions a peculiar use of the horn¹: the extraction of an insect, cerumen, etc. from the middle ear by means of a horn or a probe. The horn was evidently used as an apparatus for suction, and Suśruta describes suction as one of the methods of extracting salya from the body². Caraka³ uses horns and leeches to extract venom from a snake-bite; and Suśruta also refers to it. Besides the horns and cupping glasses, suction used to be accomplished by the surgeon's mouth.

Similarly Paul⁴ says that foreign bodies may be sucked out from the ears with a reed.

On the method of suction as a mode of treatment, Erichsen⁵ says:— "In former days, when duels with the small swords were of frequent occurrence, persons called "suckers" who were often the drummers of a regiment, were employed to attend the wounded combatants. This treatment which was conducted with a certain degree of mystery, consisted in sucking the wound till all blood ceased to flow, and then applying a pellet of chewed

¹ कर्णच्छिद्रे वर्तमानं कीडं क्लेदमलादि वा ।

गङ्गेणापहरेज्ञीमानथवापि श्लाकया ।

Suśruta Saṁhitā, VI. xxi.

² See foot-note 3, P. 108.

³ दंशं वा चुपेन्मुखेन यवचूर्णं पांशुपूर्णेन ।

प्रक्षन् विधजलौकः गङ्गैः स्वाव्यं ततो रक्तम् ॥

Caraka Saṁhitā, VI. xxv.

⁴ Paul, VI. xxiv. and III. xxiii.

⁵ Erichsen's Surgery, Vol. I. p. 341.

paper or a piece of wet linen to the orifice; in this way it would appear that many sword thrusts traversing the limbs were healed in a few days. The process of suction cleared the wound thoroughly of all blood, and drawing the sides into close apposition, placed the parts in the most favourable condition possible for union by primary adhesion. This practice might, perhaps, in many cases advantageously imitated in the present day by means of a cupping glass and syringe".

We also find Suśruta¹ describing a vasti yantra in the treatment of snake-bite. The tube is open at both ends, one end is applied to the part bitten by the snake, while to the other end the surgeon puts his mouth to suck out the poison. So this vasti yantra may be compared to the modern aspiration syringe.

Cupping instruments of metal or horn are still used by the Arabs in Kordofan and Sir R. Pasha² suggests that cupping is possibly borrowed by the west from the "most perfect physicians" the Arab. But now we are confident that the credit is due to the Hindus.

ALĀBU YANTRA.

Alābu or gourd is described to be made of the bark of the succulent fruit called alābu (*Lagenaria Vulgaris*). The pulp is scraped away and the bark is allowed to dry. Such a bark should be selected which is twelve and eighteen aṅguli in length and circumference respectively. Its mouth should be circular and should have a diameter of three or four aṅguli. A fire is to be lit inside it by burning a strip of dry cloth to produce a vacuum, and the

¹ प्रतिपूर्यं सुखं वस्तेहितमाचृष्टणं भवेत्।

Suśruta Saṁhitā, V, v.

² Vide Third Report, Wellcome research laboratory at Gordon, P. 316.

instrument to be applied instantly to the intended part of the patient's body. It should be thus used to drain blood and phlegm from the body (Vāgbhāṭa¹). In modern times cupping glasses are used for like purposes in a similar manner.

Vāllūki² describes the alābu yantra thus:—"The mouth of the instrument is well formed and has the diameter of four aīguli. The body has the circumference of eight aīgnli and is well smeared with a paste of black mud. It is used for drawing out blood". In yogaratnākara³, śṛṅga and alābu are directed to be used for extraction of blood from accidental wounds. Caraka mentions the use of alābu for blood-extraction⁴.

Another instrument known as the ghaṭī yantra was used exactly in the same way⁵. It is said to consist of a brass pot

¹ सगाहादशाङ्गुलोऽलावुर्नाहे लषा दग्धाङ्गुलः ।
चतुवरङ्गुलं हृत्तासो दीपोऽनः श्री भरकहृत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.

² अष्टाङ्गुलपरीणाहा चतुरङ्गुलनालसमिता सुसुखौ कृष्णस्तदालिमा तनुः श्रेष्ठा रक्तावसेचनेऽलावुरिति ।

Vāllūki quoted in Nibandha Saṃgraha I. xiii.

सालदैर्पयाऽलाव्या ।

Saṃśruta Saṃhitā, I. xiii.

³ क्रिन्ने भिन्ने तथा विडे चते सदो भिषगवरः ।
पट्टस्त्रेण संस्त्रेदं ब्रणं ब्रणविशारदः ॥
सुहुमुहर्यथा दुःखं ना प्राप्नोति ब्रणी नरः ।
अथवा दीप्यलवणपोटल्या स्वेदयसुहः ॥
सलमया तत्त्वोहपाचसंयोगतः क्रमात् ।
दृष्टं रक्तं स्थितं चापि गङ्गलाव्यादिभिर्हरेत् ॥

Quoted in Yogaratnākara.

⁴ रुधिरागभार्यमयवा गङ्गलावुभिराहरेत् रक्तम्—

Caraka Saṃhitā, VI. vii.

⁵ तद्वदघटीहिवा गुच्छ विलयोद्भवने च सा ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.

which is still used commonly in India by all classes of people for drinking purposes. A fire should be lit inside as before and the ghaṭī applied to the surface of the body covered by a piece of cloth. It soon becomes firmly fixed and is thus used to raise abdominal tumours by means of it for purposes of correct diagnosis and also to effect its cure by subsidence. It is still used by the common people for the same ends.

Caraka¹ says :—“After the abdominal tumour has been relaxed or softened a little by fomentation and oleaginous application, it is to be covered by a piece of cloth. Then inside a small ghaṭī, a fire is to be lit by burning kuṣā and other forms of grasses ; the pot is then to be inverted and pressed over the part covered by the cloth. By this way, the tumour would be drawn upwards &c. be made prominent. The ghaṭī is then to be taken away and after removing the cloth, and examining the extent of the tumour, it is to be incised. The different shapes of the incisions are called vimārga, ajapada and ādarśa. After incision, the tumour is to be pressed and rubbed with fingers. But the intestines and the heart must not be touched.”

The extraction of blood by means of cups, has been practised from remote antiquity. It is interesting to note that both the Latin and Greek terms—*cucurbitula* and *σικυα* signify a gourd;

¹ ज्ञिग्धस्तिव्रश्चैराय गुल्मे शैथिल्यमागते ॥
परिवेष्य प्रदीपांसु वल्लजानयवा कुशान् ।
भिषक् कुम्भे समावाप्य गुल्मे घटसुखं लिपेत् ॥
स रह्यौतो यदा गुल्मलदा घटमयोऽरेत् ।
वस्त्रान्तरं ततः क्लवा भिन्द्यादगुल्मप्रमाणवित् ॥

and we know that Alābu also means a gourd. It is curious that the instrument should have been known to the ancient Hindus and Greeks by the same name.

Prosper Alpinus¹ (16th century) who wrote a book on the state of medicine in Egypt in his time, gives drawings of cupping horns he saw there. The horns were those of young bulls, highly polished, with a small hole at the top, by which the air was extracted by suction. To close the orifice a small tab of parchment was taken into the mouth and affixed by the tongue. The Egyptians also used cupping glasses, by suction and not by fire, a method evidently unknown to them.

Hero of Alexandria (B. C. 285—222) describes an interesting form of eup. Milne summarises his account thus :²—"The figure shows a cup of ordinary flattened form, divided into two by a diaphragm. Two tubes pass through the fundus, one passing through the diaphragm, the other not. Each of the tube is fitted with another which is open at its inner end but closed at its outer end and provided with a small cross bar to rotate it. Each of these sets of tubes is perforated by small openings. In the case of the short tubes, these are outside the cup, in the case of the long tube they are inside the cup, in the chamber shut off by the diaphragm. By rotating the piston these openings can be placed in apposition or not at will, thus forming valves. Open valve A by placing the hole in apposition. Close valve B by turning the holes away from each other. The inner chamber of the cup is now shut off except for the small hole A. Apply the mouth to the valve A, and suck the air out of the chamber. Close valve A. Apply the eup to the affected part. The advantage

¹ De Med. Aegyptiorum. Ed. 1541 lib. ii. ch. xii. p. 139.

² Graeco-Roman Surgical Instruments. P. 101.

of this arrangement is that the affected part is not directly suuked upon by the mouth ; and the instrument is therefore more pleasant for the operator to use".

Celsus¹ thus describes the different kinds of cups :—"There are two kinds of cups, bronze and horn. The bronze is open at one end and closed at the other ; the horn, open at one end, as in the previous case, has at the other end, a small foramen. Into the bronze kind, burning lint is placed, and then the mouth is fitted on and pressed until it sticks. The horn is placed empty on the body, and then by that part where the small foramen is, the air is exhausted by the mouth, and the cavity is closed off above with wax and it adheres in the same way as before. Either may advantageously be constructed, not only of these varieties of materials but of another substance. If other things are not to be bad, a small cup or a narrow mouthed jar will answer the purpose. When it has fastened on, if the skin has previously been ent with a scalpel, it extracts blood ; but if it be entire, air".

Paul² remarks that "those which are made with longer necks and broader bellies are possessed of a strong power of attraction." Both Oribasius³ and Aretaeus⁴ allude to them. Antyllus says that there are three materials of which cups are made—glass, horns, and bronze. A good number of such cups occur in the Naples, British and Scottish National Museums.

¹ Celsus, II, xi.

² Paulus Aegineta, VI, xii.

³ Med. Coll. VII, xvi.

⁴ De Morb. Acut., I, 10.

Albucasis¹ gives a full account of dry cupping. In applying the instrument he advises us either to create a flame in it, or to fill it with hot water. He gives drawings of various instruments of cupping. Rhases speaks of applying a glass or a cupping instrument to draw off blood after leeching. The other Arabians give little additional information.

In modern times, cupping glasses are used in the same way as before.

V. Śalākā or Rods.

The rods, or pricker-like instruments, or probes are described to be of various kinds and are recommended to be used for various purposes²; so their length and circumference would vary according to some special uses required of them. Suśruta³ says : "There are two kinds of śalākā with their ends shaped like the head of the earthworm. They are used for probing abscesses and sinuses.

Two śalākā have their ends shaped like the wing of an arrow. These are to be used for raising any part for the purpose,

¹ Albucasis, Chirng. ii. 98.

² नाडीव्रणान् शब्दगर्भानुभास्युत्सङ्गिनः शनेः ।

करीरवालाङ्गुलिभिरेषगद्या वैष्वेणिषक् ।

Suśruta Saṃhitā. IV. i.

³ शताकांश्चात्यपि नाना प्रकाराणि नाना प्रथोजनानि यथायोगपरिणाहदीर्घाणि च तेषां गगडुपदशरपुड्डसंपर्फण वडीशमुखे इ इ एषण त्यूहनचालनाहरणार्थसुपदिश्ये ते । मसूरदल-मावमुखे इ किञ्चिदानताये सोतोगतश्ल्लोङ्गरणार्थे । षट्कार्पासक्तोशीषाणि प्रमार्ज्जन क्रियाम । त्रीणि दर्ढीकृतीनि खल्लमुखानि चारौपधप्रणिधानार्थे । त्रीखन्नानि जाम्बवदनानि वीण्वडुग्वदनानि पड़वाप्रिकन्मस्त्रभिप्रे तानि । नामार्वदहरणार्थमेकं कोलास्यदलमात्मसुखं खल्लतीक्ष्णोठं । अञ्जनार्थमेकं कलायपरिमण्डलमुभयतो मुकुलाय । मूत्रमार्गविशेधनार्थ-मेकं मान्तीपुष्पवल्लायप्रमाणपरिमण्डलभिति ।

Suśruta Saṃhitā. I. vii.

after incision, of extracting any foreign body from it. Others assign to them the function of bringing together the lips of the wound caused by an abscess being opened and emptied.

Two śalākā have their ends shaped like the hood of a snake. They are useful for transferring any material from one part to another. Some of the simple probes used by the ancient Greek and Roman surgeons carried a single or double snake of Æsculapius at one end. But evidently it was meant as an ornamentation and served no useful purpose.

Two śalākā have their ends shaped like a fish-hook but are blunt. They are used for extracting any extraneous material from the muscles or bones”.

The last six kinds of Suśruta are practically the same as the six śaiku of Vāgbhaṭa,¹ which are the following :—

The śaiku are six in number. Amongst these, two are twelve and sixteen aṅguli long respectively. They are used for the purpose of raising a foreign body upwards from the wound.

Two varieties have their ends shaped like the hood of a snake. They are ten and twelve aṅguli long ; and they are used for the purpose of moving a foreign body in the wound in all directions.

Two varieties have the shape of a fish-hook—the ends resembling the stem of an arrow. These are used for the extraction of foreign bodies from the wound.

¹ शङ्खवः षडुभौ तेषां षोडशादशाङ्गुलौ ।

व्युहने, हि फणावक्त्री द्वौ द्वादश दशाङ्गुलौ ॥

चालने शरपुङ्गा सर्गा वाहार्ये वडिशाकृतिः ॥२५.

Suśruta¹ mentions another pair of śalākā which have their ends shaped like a masūra pulse, and slightly curved ; these are used for the purpose of extracting a foreign body from the external outlets of the body such as mouth, nose, etc. They are eight and nine aṅguli long respectively.

SWAB PROBES.

Six śalākā are used for the purpose of wiping out the principal excretory canals of the body viz., rectum, nose and ears.² Their ends are covered with cotton like a head-dress (pāgḍī). The two śalākā intended for the rectum, have the lengths of ten and twelve aṅguli respectively for short and long distances. So the two varieties of probes for the ears are eight and nine aṅguli long, while the other two kinds of probes for the nose are six and seven aṅguli long respectively. Some commentators are of opinion that these six śalākā are meant for clearing abscesses.

For similar purposes the Greek and Roman surgeons used the spathomele or spatula probe. Priseianus³ writes : "First of all we must frequently wipe away the elots of blood from the nose

¹ See foot note 2, P. 155.

उभेगण्डपदमुखे स्रोतभ्यः शल्वहारिणी ।

मस्त्रदलवक्ते द्वे साता मष्टनवाङ्गुले ॥२४

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

² कार्पास विहितोषीषाः शल्वाकाः पट्प्रमार्जने ।

पायावासान्न दूरार्थे द्वे दश इष्टनवाङ्गुले ।

द्वे पट्ट सप्ताङ्गुले ग्राणे द्वे कर्णेष्टनवाङ्गुले ॥२८॥

Ibid.

³ Priscianus. xiv.

with the end of a spathomele wrapped on the ‘berry’ with soft wool, and then occlude it by plugging with wool in the same way.”

The use of probes, having the ends wrapped with wool, for wiping out discharge of pus from the ears of horse, is mentioned by Jayadatta Suri¹ in his Treatment of Horses.

SPOON-SHAPED² PROBES.

Three probes are described to have their ends shaped like a khala or mortar with a conical cavity, and so they resemble a spoon. They are to be used for the purpose of applying caustic solutions, etc.²

Similarly cyathiscomele, which is a variety of spathomele in which the spatula is replaced by a spoon, is said to have been used by the Greek surgeons to mix, measure and apply medicaments. The specimens of these instruments occur in the Naples Museum. Sometimes the edge of the spoon is sharp and is recommended to be used as a eurette. Scrivonius Largus directs us to use the spoon of an ear specillum for the application of caustics to haemorrhoids.

¹ प्रयस्सावेण जानीयात् शोथमध्यन्तरोऽस्मि ।

पिनुना वैष्टियिका तु शलाकाग्यं समाहितः ॥

तेन कर्णालरे पूर्यं कर्षयित्वा विचक्षणः ।

पातितस्य मुवडस्य पूर्वेन्मधूसर्पिषा ॥

Aśvavaidyaka, Ch. 34, v. 2, and 3.

² See foot-note 2, P. 155.

NAIL-SHAPED PROBES.

Vāgbhaṭa¹ describes three other probes for the same purpose. They are eight aṅguli long; their ends are bent and resemble in size and shape the nails of the third, fourth, and fifth fingers respectively.

Paul² mentions a nail-shaped probe in the treatment of bubone-cele. But this was applied as a cautery and not for the application of medicaments. Nail-shaped cauteries are also referred to by Hippocrates³ in the treatment of recurrent dislocation of the shoulder-joint.

JĀMVOVAUṢTHA PROBES.

Three probes are called Jāmvovauṣtha for their ends are shaped like the fruit of Jambul tree (*Eugenia jambolanum*).⁴ Three other śalākā have their ends shaped like aṅkuṣa or elephant driver's goad.⁵ They may be made of any length required

¹ अष्टाङ्गुला निम्नमुखा स्त्रिसः चारौप्रघ क्रमे ।

कनीनी-मध्यमाऽनामी-नखमान-समैर्मुखैः ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.

² Paulus Aegineta, VI. lxv.

³ Hippocrates iii. 15.

⁴ See foot-note 2, P. 155.

श्लाका जाम्बवौष्ठानं चारिंग्रौ च पृथक् तयं ।
युञ्जात् स्थूलानु द्रीघांनां,

[Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.]

⁵ See foot-note 2, P. 155.

For the diagram of the aṅkuṣa see Fergusson's Tree and Serpent Worship; Plate xxxiii. Sanchi, xxxvii, fig. I. and xxxviii, fig. 1 & 2.

by the surgeon. These six varieties are recommended for the purpose of applying caustic medicaments and the actual cautery.

Paul¹ mentions a gamma-shaped cautery in the radical cure of hernia. This cautery is shaped like the Greek letter Γ; so it resembles the aṅkuśa cautery of the Hindus. The aṅkuśa is similar in appearance to the Greek letter.

One variety, which is used for the purpose of removing a tumour from the interior of the nasal cavity, has its end shaped like a khala or mortar, with sharp edges, and of the size of half the stone of the fruit of the jujube tree (*Ziziphus jujuba*)². Vāgbhaṭa³ mentions a similar probe for the purpose of applying actual cautery to a nasal tumour. Its end resembles in shape and size, a half of the stone of the fruit of the jujube tree.

This spoon-shaped probe of the Hindus is comparable to the curette like sharp eyathiscomele of the Greeks, noted before.

COLLYRIUM PROBES.

For the purpose of applying collyria to the eyes, a rod is mentioned having the length of eight aṅguli and the thickness of a pea. Its both ends are shaped like buds⁴.

The probes for applying collyria to the eyelids, should be six aṅguli long, with a rounded bulbous end. They may be made of gold, or silver, or copper, or iron, or stone. For the habitual use of collyria, a lead probe is prescribed. When medicines are directed

¹ Paul, VI, lxii.

² See foot-note 2, P. 155.

³ कौलास्थि दल तुल्या स्वा नासाशीर्षं बुद्धं दाहक्तं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

⁴ See foot-note 2, P. 155.

to be applied not only to the lids but also to the eonjnnetiva, the finger is recommended as it is a softer and safer instrument. Again the probes would vary according to the nature of the collyria to be used. As for the application of lekhana collyrium, the probe should be made of copper and should be ten aṅguli long. The probe is advised to be made thinner at its middle to afford a firm grasp by the surgeon. The ends are shaped like buds. For applying ropāṇa collyrium, a similar probe is to be used, but it should be made of steel; while for the application of a collyrium for the improvement of the visual strength, a probe made of gold or silver, and having the size and shape of a finger is recommended by Cakradatta.¹

Suśrnta² likes a probe of steel, or bell-metal, or copper for lekhana collyrium; and of gold, or silver, or horn, for ropāṇa and snehana collyria. The probe should be eight aṅguli long, and the eye is to be kept open and fixed by the left hand, while the right hand is to hold the probe, and so the collyrium is to be applied to the eye.

¹ दशाङ्गुला तनुर्मध्ये श्लाका सुकुलानना ॥
प्रशस्ता लेखने तास्मी रोपणे काललोहजा ।
अङ्गुलीव मुवर्णेत्या रूप्यजा च प्रसादने ॥

Cakradatta. Āśhyotana Cikitsā.

² तेषां तुत्यगुणान्वेव विदध्याद् भाजनान्वयि ।
सौवर्ण्यं राजतं शाङ्गुलाभं वैदूर्यकांस्यजं ॥
आयसानि च योज्यानि श्लाकाश्च यथाकभं ।
वक्रयोर्मुकुलाकारा कलाय परिमण्डला ॥
अष्टाङ्गुला तनुर्मध्ये सुकृता माधुनियहा ।
औडुम्बर्यश्चमजातानि शारीरी वा हिता भवेत् ॥

Suśruta Samhitā. VI. xviii.

Śāringadhara¹ says: "The collyrium probe should be made of stone or metal. It should be eight aṅguli long and its ends must be made smooth and rounded like a common pea. For lekhana collyrium, a copper, or iron, or stone probe is to be used, while for ropana collyrium the tip of the finger is recommended for its softness."

Of the probes used by the Hindus for applying collyrium to the eyes, fortunately we possess a few specimens. Among the objects of interest found in the excavations at Bijnor, we find, "fourthly, one copper salai or instrument for applying antimony to the eye, similar to those found in the Bihat excavations."²

¹ सुखयोः कुण्ठिता श्वच्छा श्लाकाष्टाङ्गुलीन्मिता ।
अश्मजा धातुजा वा स्यात् कलायपरिमण्डला ॥
ताम्बलोहाश्मसंजाता श्लाका लेखने मता ।
सुवर्णरजतोङ्गूता श्लाका स्नेहने मता ।
अङ्गुलीच मृदुलेन कथिता रोपणे वृधैः ॥

Śāringadhara Samgraha. III. xiii.

Yogaratnākara. Eye Diseases. P. 823.

त्रिफल सलिलयोगे भृङ्गराजद्रवे च
हविषि च विषकल्पे चौर आजि मधूये ।
प्रतिदिनमय तप्ति सप्तधा सीसमेकं
प्रणिहितमय पश्चात् कारयेत् तच्छ्लाकाम् ॥
सवितुरुदयकाले साञ्चना व्यञ्जना वा
करकरिकसमेतानर्मपैचिद्यरोगान् ।
असितसित समुद्यान सन्धिवर्त्मभिजातान्
हरति नयनरोगान् सेव्यमाना श्लाका ।

Cakradatta, Netraroga Cikitsā.

² "Vide Princep's (Thomas') Indian Antiquities, fig. 18, pl. iv" J.A.S.B. IX. 1. 7.

Specillum with two olivary ends formed a variety of probe of the Greek and Roman surgeons. It was used as an ordinary probe in dealing with crooked fistulæ, and as a cautery to destroy the roots of hairs after epilation. Sometimes it carried an eye in one of its olives and was used in the treatment of nasal polypus. The eye was threaded with a cord having many knots along it. The other end of the probe was pushed through the nose and withdrawn by the mouth, and then by a sawing movement of the cord with both hands of the surgeon, the polypus was removed.¹ A single probe for the application of semi-solid medicaments occurs in the outfit of the oculist of Rheims, in the museum at St. Germain-en-Laye and is figured by Milne.²

KARĀ-ŚODHANA OR EAR-CLEANER.

This śalākā is said to have its end shaped like the end of a leaf of Aśvattha (*Ficus religiosa*). The instrument looked like a sruva—one of the famous spoons used in sacrificial ceremony.³ It was used for the purpose of extracting wax from the ears.

The different kinds of spoons used in the ancient Hindu ceremonies were as follows: "Three different srnk or offering-spoons are used *viz.*, the guhu, upabhrit and drubha. They are made each of a different kind of wood, of an arm's length (or according to others, a cubit long) with a bowl of the shape and size of the hand, and a hole cut through the bark and front

¹ Paul VI. lxxxvii, VI. xiv, VI. xxv.

² Graeco-Roman Surgical Instruments, pl. xi, fig. 5.

³ कर्णशोधन सञ्चय पत्र प्रातं सूचानन् ॥

side of the bowl and fitted with a spout, some eight or nine inches long and shaped like a goose's bill. The sruva or dipping-spoon, on the other hand, chiefly used for ladling the clarified butter (or milk) from the butter vessel into the offering-spoons, is of the khadira wood (*Aceaeia cateehu*), a eubit long, with a round bowl measuring a thumb's joint across and without a spout".¹

So we see that the bowl of the *karma-śodhana* was round in shape.

Suśruta also mentions a śalākā for the extraction of eerumen or minute insects from the ears.² Cakrapāṇi³ alludes to it. In modern times, the ear-cleaner, as used commonly in India, is a tāla yantra. Ear specillum is frequently mentioned by the Greeks and Romans. It consisted of a small narrow scoop at one end and a simple probe at the other. The use of the scoop is thus described by Arehigenes⁴: "If a bean, stone, etc. fall into the ear, remove it with the small narrow scoop of the ear specillum". Celsus⁵ directs us to extract a seab or cerumen by means of the ear specillum.

The ear scoop used by the modern surgeons is a narrow scoop, more like the Hindu puja vessel known as kuśi. The ear scoop is often made in combination with a director.

¹ Satapatha Brāhmaṇa, Sacred Books of the East. I. 3. 1. 1. foot-note.

² See foot note 1, P. 149

³ क्लेदधित्वा तु तैलेन स्वेदेन प्रविलाय च ।

शोधयेत् कर्णगृथस्य भिषक् सम्यक् शलाकया ॥

Cakradatta, Karṇaroga.

⁴ Galen. XII, 652.

⁵ Celsus, VI. viii.

GARBHA-ŚAṄKU. FETUS OR TRACTION HOOK.

The end of this instrument is said to have been bent like aṅkuśa or elephant driver's goad. It is described to have the same length as the other śaṅku have *i. e.* ten to sixteen aṅguli, and it is eight aṅguli in width.¹ It is recommended for extracting a dead foetus from the mother's womb, after perforating its head by the maṇḍalāgra or mudrikā knife. Suśruta recommends us to perforate the head and then to extract the bones by the śaṅku or hook, and lastly to apply traction by fixing it about the chest or axilla. If the head can not be perforated, it is to be applied to the eyes or cheeks.²

Traction hook for extraction of a dead foetus was well known to the ancients. Hippocrates³ bids us break up the head of the foetus with a cephalotribe and remove the bones with bone foreeps, or deliver it by a traction hook inserted near the clavicle. Celsus⁴ advises us to insert a smooth hook with a short point and to fix it in the eye, or the ear, or the mouth, or the forehead, and so the foetus is to be dragged down. Soranus points out the best places for the insertion of the hook to be the eyes, the oeciput, the mouth, the clavicles, and the

¹ न तोऽये शङ्कुना तुल्यो गर्भं शङ्कुरितिमृतः ।
अष्टाङ्गला. व्रतसेन मूढगर्भं हरेत् नियाः ॥ १६ ।

Aṣṭāṅga Hṛdaya Saṁhitā I. xxv.

² तत्र नियमाशास्य मण्डलागेणाङ्गुलीश्चनेण वा शिरोविदार्य शिरःकपालान्याहत्य शङ्कुना गृहीत्वा रसि कचायां वापहरेदभिन्ने शिरसि चाचिकृटे गन्ते वा ।

Suśruta Saṁhitā, IV. xv.

³ Hippocrates. II. 70.

⁴ Celsus. VII. xxix.

ribs in head presentations; and the pubes, ribs, and clavicles in footing eases.¹ Soranus, Aetius² and Paul³ direct us to extract the foetus in the same way but they recommend us to use two hooks instead of one, in order that the pulling may be straight down and not to one side.

Albucasis,⁴ Rhases,⁵ Haly Abbas,⁶ and Avicenna⁷ give similar directions for opening the child's head and for delivering the foetus with hooks.

This purpose in modern times is served by the blunt hook and erotehet.

YUJÑA-ŚAÑKU OF MIDWIFERY FORCEPS.

An instrument is thus named and figured by modern writers on Hindu surgery, bearing some resemblance to the modern forceps, for extracting the child alive. We have, however, no mention of any such instrument in the works of Caraka, Suśruta Vāgbhaṭa and other ancient authorities. The Greeks and Romans were also ignorant of it; and the Arabians fared no better, though Adams, in his commentary on Paul⁸ asserts that Avicenna refers to forceps for the delivery of living children. Mulder, in his valuable work,⁹ gives an extract from a translation from the works of Avicenna supporting

¹ Soranus. II. xix.

² Aetius. IV. iv. 23.

³ Paul. VI. lxxix.

⁴ Albucasis. Chirrug. II. 76 and 77.

⁵ Rhases. Cont. xxii.

⁶ Haly Abbas. Pract. ix. 57.

⁷ Avicenna. iii. 21, i, 24.

⁸ Paulus. Eginita. III. lxxvi.

⁹ Historia Forcipum et Vecticium. p. 6.

the same conclusion. Smellie¹ says : "With regard to the fillets and forceps, they have been alleged to be late inventions ; yet we find Avieenna recommending the use of both. The forceps recommended by Avieenna is plainly intended to save the foetus". "He recommends all the old methods for assisting in natural labours ; and if the woman can not be delivered by these, he orders a fillet to be fixed over the head : if that can not be done, to extract with the *forceps* ; and should these fail, to open the skull ; by which means the contents will be evacuated, the head diminished, and the foetus easily delivered."² Playfair³ also holds the same view. The point is however by no means settled. For Milne⁴ says : "A full consideration of Avieenna's words seems to me to lead to the conclusion that he is describing no more than extraction with a craniotomy forceps. If the forceps fail, the child is to be extracted by incision, as in the case of a foetus already dead (and decomposed so that the forceps would not hold)."

Thus we may be sure that there is no available evidence of the use of delivery forceps by the Hindus, Greeks, Romans and Arabs ; and the Chamberlens are still the undisputed claimants to the glory of the invention.

But there is no doubt that the Hindu surgeons tried extraction of the living foetus by manual traction. The hands are recommended to be well oiled and introduced into the uterus. If the child be dead, sharp instruments are advised to be intro-

¹ Smellie, Treatise on Midwifery, p. 40.

² Ibid, Edited by McClintock. New Syd, Soc, vol. I, Introduction p. 50.

³ Researches on Operative Midwifery, p. 10.

⁴ Greco-Roman Surgical Instruments, p. 156.

dueed into the vagina for cutting upon the foetus. But on no account such instruments are to be used so long as the child is alive.¹

SARPA-FAÑĀ OR SNAKE'S HOOD.

It is also called agra-bakra *i. e.* the end bent. It is a śanku or hook similar to the above, the end being bent like the hood of a snake.² It is to be used for the purpose of extracting stone after operation.

Suśruta, in the operation for extraction of stone through the perineal incision, directs us to use the agra-bakra to bring the entire stone out of the wound. But in the case of females, he recommends us to use a knife having a spoon like a scoop, to prevent the formation of a vesico-vaginal fistula.³ Is it a spoon-shaped knife, or is it a double instrument on a handle—a knife at one end and a scoop at the other? The Greeks used a knife having a scoop at the end.

¹ गर्भं जीवति मूढं तु गर्भं यदेन निर्हरेत् ।

हस्तेन सर्पिषाक्तेन योनेरन्तर्गतेन सा ॥

मृते तु गर्भं गर्भिण्या योनौ शस्त्रं प्रवेशयेत् ।

शस्त्रशास्त्रार्थविदूषी लघुहस्ता भयोजिज्ञता ।

सचेतनं तु शस्त्रेन न कथञ्चन दारयेत् ॥

Yogaratnākara, Mudhagarva Cikitsā.

² अश्मर्याहरणं सर्पफलावङ्क्रमं अग्रतः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

³ यथा च न भिद्यते न चूर्ण्यते वा तथा प्रयत्नेत चूर्णमल्पमप्यवस्थितं हि पुनः परिवड्डिमेति तमात् समस्तामप्रवक्त्रे णाटदैत । म्बीणात् वल्पिपार्श्वगतो गर्भाशयः सन्निकृष्टः तमात्रा सामुत्सङ्घवक्ष्यस्त्रं पातयेदतोऽन्यथा खल्वासां मूत्रसावी व्रणो भवेत् ।

Suśruta, Saṁhitā, IV. vii.

Celsus¹ describes the extraction of stone through a perineal section by means of the lithotomy seoop. "The scoop is slender at the end and flattened out in the shape of a semi-circle, smooth externally where it comes in contact with the tissue, rough internally where it meets the ealeulus". It was a long hook-like instrument.

Aetius² mentions a special stone extractor, under the treatment of eaculns in the female. Some understand by it the lithotomy foreeps.

In modern times we use the lithotomy foreeps and scoop for the same purpose.

I take this opportunity of referring to the celebrated passage in the famous Hippocratic oath, which runs as follows: "I will not cut persons labouring under the stone, but will have this to be done by men who are praetitioners of this art". This sentence has given a good deal of trouble to the commentators and they have failed to understand the true reasons as to why Hippocrates specially forbade the practice of this operation. "M. Littré finds some diffiulity in aceounting for the circumstance that the noviciate in surgery is interdicted from the operation of lithotomy." Adams,³ commenting on the sentence, says: "Why this operation was proscribed, can not indeed be satisfactorily ascertained," and he quotes the Arab Physieian, Avenzoar⁴, who "pronounees the operation to be one, which no respectable physician would witness, and far less to perform."

¹ Celsus. vii. xxvii.

² Actius. IV. iv. 94.

³ The Genuine Works of Hippocrates. Vol. II. P. 777—8.

⁴ Avenzoar. II. 2, 7.

The explanation that this was proscribed because there were men who devoted themselves exclusively to this kind of treatment, and that if the qualified surgeons be allowed to practise the operation, they would interfere in the sphere of action of the lay lithotomists, cannot be considered satisfactory. For the question still remains the open one, why should Hippocrates proscribe this operation from the domains of scientific surgery, simply because a few laymen happened to practise it.

The real explanation is that in Hippocrates' time success in the operation was very difficult to achieve, consequently he interdicted the operation much in the same way as abdominal operations were considered sacred before the days of antiseptic surgery. It is curious to find that Suśrata calls this operation the worst of all surgical operations, for he says¹ : "Even experienced and able surgeons fail to attain success by operation for the stone. So the surgical treatment is the worst of all treatment here. But if you do not operate, the patient will die; and it is doubtful whether he will live after the operation; so give him the chance of operation in God's name." I do not know whether this passage of Suśruta has any causal relation to the remarks of Hippocrates, but there is no doubt that the former serves as a better commentary on the latter, than anything hitherto suggested.

Adams² says that this operation was practised by a class of men,

¹ कुशलास्यापि वैद्यस्य यतः सिद्धिरिहात् वा ।
उपक्रमो जघन्योऽयमतः स परिकीर्तिः ॥
अक्रियायां भ्रुवो मृत्युः क्रियायां संशयो भवेत् ।
तस्मादापृच्छा कर्त्तव्यमीश्वरं साधूकारिणा ॥

Suśruta Saṁhitā. IV. vii.

² Commentary on Paulus Aegineta. Vol. II. P. 363.

separate from the surgeons, in all countries in ancient times, and points out that the ancient operation of lithotomy is still practised with great success by the native doctors of Hindusthan. No conclusion is, however, to be drawn from the modern practices in India, as we find separate classes of men not only for stone, but also for bone-setting, cataract, etc. And whatever may be the practice in modern times, we find that during Suśruta's time, the operation was not the privilege of the laymen.

ŚARAPUṄKHA-MUKHA PROBE.

This instrument is also described to have its end bent like the hood of a snake. It is four aṅguli long and is recommended to be used for the purpose of extracting a tooth from its socket.¹

Tooth elevator or instrument for levering teeth is mentioned by Galen.² It is of the same size as the bone lever which, according to Paul,³ is seven or eight aṅguli long.

This instrument resembles in shape and action the tooth elevator of the modern surgeons.

ARDHACANDRA-MUKHA ŚALĀ. HALF-MOON PROBE.

The first half of this variety of śalā is curved like a half-moon, to which is attached the second half as a rounded handle.⁴ Suśruta advises us to use it for the purpose of applying actual

¹ शरपुङ्क्षम् दलपातनं चतुरहूलम् ॥

Aṣṭāṅga Hṛdaya Saṃhitā. I. xxv.

² Galen. xviii. 593.

³ Paulus Aegineta. VI. evi.

⁴ शलाकामन्तवर्त्मनि ।

मध्योर्द्धे वृत्तदण्डात्र मूले चार्द्दन्तसन्निभां ॥

Aṣṭāṅga Hṛdaya Saṃhitā I. xxv.

cautery to the groin in buboncele, to prevent the hernia from entering into the scrotum.¹

A crescent-shaped cautery was also used by the Greek and Roman surgeons. So Paul² says that in cases of sloughing of the prepuce we must cut it off and use lunate cauteries to stop haemorrhage and prevent the spreading of the wound. Again he mentions a cautery shaped like the Greek letter Τ, in the radical cure of hernia.³

BONE LEVER.

Instruments for levering fractured bones into their proper positions are mentioned several times by Suśruta. In the treatment of fracture of the nasal bones, a śalākā is recommended to be used as a bone lever for raising and depressing the fractured ends.⁴ Sometime a muṣala or pestle is advised to be used.⁵ It is a thick wooden pestle the end of which is plaited with iron. It is still used to strike upon paddy to separate the husk from the rice. Suśruta mentions its use to reduce dislocations of the joints of the shoulder and neck.⁶

¹ तव या वङ्गाणस्था ताः दहेदद्वन्द्ववक्त्रया ।

सम्यग्मार्गावरीधार्यं कोशप्राप्तां तु वर्जयेत् ॥

Suśruta Saṁhitā, IV. xix.

² Paulus Aegineta. VI. lvii.

³ Ibid. VI. lxii.

⁴ नासां सन्नां विष्टत्तां वा कृच्चौं कल्पा शलाकया ।

Suśruta Saṁhitā, IV. iii.

⁵ सन्नसन्नमर्यत् सिन्नमन्तकम् सूषलेण तु ।

तथोन्नतं पीडयेच वधीयाह्नाद्धमेव च ॥

Ibid.

⁶ तैलपूण कटाहे वा द्रोणाण वा शायवेन्नरं ॥

मूषलेनोत्त्विपेत् कवामांससन्धौ विसंहन्ते ।

स्थानास्थितञ्च वधीत स्वलिकेन विचक्षणः ॥

Ibid.

The pestle was also used by Hippocrates¹ to reduce dislocation of the shoulder joint. He says : "Those who accomplish the reduction forcibly bending it round a pestle, operate in a manner which is natural. But the pestle should be wrapped in a soft shawl (for thus it will be less slippery), and it should be forced between the ribs and the head of the humerus. And if the pestle be short, the patient should be seated upon something, so that his arm can with difficulty pass above the pestle. But for the most part the pestle should be longer, so that the patient when standing may be almost suspended upon the piece of wood. And then the arm and forearm should be stretched along the pestle, whilst some person secures the opposite side of the body by throwing his arms round the neck, near the clavicle"

The bone lever used by the Greeks is thus described by Paul:² "It is an instrument of steel about seven or eight fingers' breadth in length, of moderate thickness that it may not bend during the operation, with its extremity sharp, broad and somewhat curved."

DIRECTOR.

Suśruta³ mentions the use of eṣanī or metallic probes not only to ascertain the course of the fistulous track but also to raise the bridge of skin covering the sinuses, so that the surgeon may operate on it as a guide. Cakradatta⁴ also uses a probe to

¹ The Genuine Works of Hippocrates. Adams' Trans. p. 372.

² Paulus Aegineta, Vi. cxi.

³ पक्षेषु चौपस्त्रिग्धमवगाहस्त्रिन्नं श्वायां सन्निवेश्यार्शसमिव यन्त्रयित्वा भगद्वरं समीक्ष्य पराचौनमवाचौनं वा वहिम्मुखमन्मुखं वा ततः प्रणिधायैषणीमुम्भ्यं साशयमुद्देश्यस्त्रेण Suśruta Sañhitā, IV. viii.

⁴ नाडीनां गनिमन्त्रिष्य शस्त्रेनापाप्य कर्मवित्।

Cakradatta, Nādiivraṇa Cikitsā.

learn the direction of the wound before operation. It is also mentioned in the Yogaratnākara.¹

In the treatment of fistulæ, Celsus² also says: "A director being inserted into them down to their termination, the skin ought to be incised." It is not mentioned that the eṣanī or probe was grooved, but there is no doubt of its use like a grooved director, so common nowadays. The discovery of such a director, along with several other surgical instruments, which are preserved in the Musée de Cinquantenaire, Brussels, proves that it was known to the Romans.

URETHRAL PROBE.

A variety of śalākā is described by Suśruta³ to have its end rounded like the stalk of a mālatī flower (*Echites caryophyllata*, Rox.) It is to be used for cleaning the urethral canal.

Caraka⁴ mentions a probe for examining the direction of the urethral canal and its pathological condition, before introducing the tube of the urethral or bladder elysters into it.

¹ नाडीनां गतिसम्बोद्य शस्त्रे शोतृपाद्य कर्मवित् ।

Yogaratnākara, p. 346.

² Celsus, VII. iv.

Græco-Roman Surgical Instruments, p. 73.

³ सूतमार्गविशैधनार्थं एकं मालनीपुष्पहन्तायप्रमाणं परिमण्डलमिति ।

Suśruta Saṁhitā, I. vii.

⁴ कृजोः सुखोपविष्टस्य हटे मेद्वे घृतान्विते ।

श्लाकयान्वित्य गतिं यद्यप्रतिहता त्रजीत् ॥

ततः शैफःप्रमाणेन पुष्पनेत्रं प्रवेशयेत् ॥

Caraka Saṁhitā, VIII. ix.

Class VI. The Upayantra or Accessory Instruments.

The sixth class of the blunt instruments comprises the upayantra or accessory instruments. By surgical instruments, the Hindus consider not only the instruments proper, but also any mechanical aid by which the object of the surgical treatment is attained. Thus even medicinal agents are considered under this head for they help the inflammatory swellings to subside, or suppurate, or burst open as by various external applications. The accessory instruments are :

1. RAJJU OR THREAD.

As an example of thread being used as an instrument of surgery, we know that the thread smeared with caustics are recommended by Suśruta¹—kṣāra sūtra or caustic thread—for the operation of fistula-in-ano. For further informations on the subject see “Eṣanī or sharp probes” under the Śāstra.

Thread as a material of phalavarti or tent is mentioned by Śāringadhara.² If after a vaginal or intra-uterine douche, the injection does not flow out, he advises us to introduce a strong tent made of thread, dipped in oleaginous medicines of the

¹ क्षगदुर्बलभीरणां नाडीमर्घश्चिताच या ।

चारसूत्रेन किञ्चान्नतु शस्त्रेण वृद्धिमान् ॥

Suśruta Saṃhitā, IV, xvii.

Cakradatta, Nāḍīvraṇa Cikitsā.

² फलवर्ति निदध्यादा योनिमार्गे दृढ़ं भिषक् ।

सूत्रैविनर्मितां सिंधां शोधनद्रव्यसंयुताम् ॥

Śāringadhara Saṅgraha, III, vii

sodhana (Purifier) group. Cakradatta¹ uses caustic threads in the treatment of piles by ligature.

2. VENIKĀ OR TWINE.

The use of twine as a ligature to be applied above the part bitten by a snake to arrest the circulation of blood towards the heart is mentioned by Suśruta.² Caraka³ also advises us to tie ligatures above and below the bitten part, then to squeeze out the poison towards the wound, whence it is to be drawn out through incisions made by a knife.

3. PATTĀ OR BANDAGES.

For the proper application of bandages, Suśruta mentions the following materials to be necessary :⁴ viz., cloth manufactured

¹ भावितं रज्जनीचूर्णः स्तु हौचौरे पुनःपुनः ।

वस्त्रनात् सुट्टदं सूवं भिनत्पश्चीमं भगन्दरं ॥

Cakradatta, Arśaroga Cikitsā.

² सा तु रज्जादिभिर्वद्धा विषप्रतिकरीमता ।

Suśruta Samihitā, V. v.

³ दंशात् तु विषं दष्टस्य विसृतं वेणिकां भिषक् वद्धा ।

निष्पीडयेदभृणं दंशमुड्ररेन्मर्मं वर्जम् ॥

Caraka Samihitā, VI. xxv.

⁴ अत ऊङ्ग व्रणवस्त्रन द्रव्याख्युपदेक्षामः । तद्यथा चौमकार्पासविकटहूल कौशेय पचोर्ण चौनपट्टचर्मान्तर्बल्कलालावृश्कललता विदलरज्जुतलफलसन्तानिका लौहानीति तेषां व्याधि कालं चाविच्छोपयोगः प्रकरणतश्च षामादेशः । तत्र कोशदामस्वस्तिकानूवेज्ञितप्रतोली-मण्डलस्थगिकाथमकखट्टाचौनविवस्त्रवितानगोफणाः पञ्चाङ्गी चेति चतुर्दशवस्त्रविशेषाः ।

तेषां नामभिरवाक्तयः प्रायेणव्याख्याताः । तत्रकोशमहुष्टाङ्गुलिपर्व्वसु विदध्यात् । दाम सम्बाधिइः । सभिकूर्वकभूस्तनान्तरतलकर्णेषु स्वस्तिकं । अनुवेज्ञितन्तु शखामुः । यीवामेद्वयोः प्रतोली॒ । हत्तेऽङ्गे मण्डलं । अहुष्टाङ्गुलिमेद्वयेषु स्थगिकां । यमलव्रणयोर्यमकं । हनुशङ्गगडेषु खट्टां । अपाङ्गयोशीनं । पृष्ठदरोःसु विवर्धं । मूर्डणि वितानां चिद्रकनासौष्ठां सवस्तिषु गोफणां । जवृणजर्ङ्गं पञ्चाङ्गीमिति । यो वा यस्मिन् शरीर प्रदेशे मविविष्टो भवति तं तस्मिन् विदध्यात् ।

Suśruta Samihitā, I. xviii.

from the fibres of plants, flax, cotton, wool, blankets, silk, leather, Chinese cloth, inner barks of trees, bark of bottle gourd (*Cucurbita lagenaria*), tendrils of twining plants, cane or pieces of split bamboo, rope, fruits as those of *Bombax Malabaricum*, blades of knives, and plates of metals as gold, or lead, or iron. These articles should be used with due consideration as regards the nature of the disease, the time of their use and the purpose in hand. He describes fourteen varieties of bandages as follows :—

1. Kośa :— a hollow cylinder or sheath to be applied to the joints of the thumb and fingers. This form of bandage is to be applied over the stumps after amputation of the limbs.
2. Dāma (*i.e.* tail of a quadruped ?) :— it is a large bandage to be tied round a part for the relief of pain or cramps.
3. Svastica or a circular cross-bandage :— it is to be applied round the joints, the space between the tendons of the great and second toes, the intermammary region, the glabella (space between the eyebrows), the plantar surfaces of the feet, the palmer surfaces of the hands, and the ears. It is also the form of bandage recommended in dislocations of the shoulder joint.
4. Anuvellita or an encircling bandage :— it is to be applied to the limbs. This form of bandage is recommended to be applied to the limbs in cases of oblique, deep, and large cuts inflicted by a knife. A leather bandage applied in the form of gophaṇā would also serve the purpose. The encircling bandage is also advised in cases of fracture of the ribs.
5. Protolī :— a broad bandage for the neck and penis.
6. Maṇḍala or a circular bandage :— it is to be applied to

the round parts of the body such as the arms, sides, abdomen, thighs, and back.

7. Sthagikā or a supporter :— a bandage enclosing a splint and pastes of medicaments to keep the parts firm. It is to be applied over the ends of the thumb, fingers, and penis. Suśruta directs us to use this bandage round the scrotum after tapping the hydrocele.

8. Yamaka or a double-bandage :— a pair of circular bandages applied to a couple of ulcers on a part.

9. Khatvā or a four-tailed bandage :— it is recommended for the temples, cheeks and lower jaw.

10. Chīna or a banner bandage :— a bandage for the inner angles of the eyes.

11. Vivandhana or a circular chest-bandage :— it is the bandage for the back, abdomen and chest.

12. Vitāna or a canopy bandage :— a large bandage for the head.

13. Gophaṇā¹ (*lit.* a sling for throwing stones) :— a one-leave bandage for the chin, nose, lips, shoulders and pelvis.

¹ शाखामु प्रतितां स्थिर्यक् प्रहारान्वितान् भृणं ।

सीच्येत् सम्प्रिवेश्याशु सम्यस्थीन्यनुपूर्वशः ॥

वद्धा वेण्टिकेनाशु ततस्त्वेलेन सेचयेत् ।

चर्मना गोफणावन्धः कार्यो यो वा हितो भवेत् ॥

Suśruta Saṅhitā, IV. ii.

पादौ निरस्तमुपस्थ जलेन प्रोच्छ चान्तिणी ।

प्रवेश्य तु त्रसेवन्या सुकौ सीर्वत्ततः परं ॥

कार्यो गोफणिकावन्धः कव्यामावेश्य यन्तकं ॥

Ibid., IV. ii.

14. Pañcāṅgī or a five-tailed bandage¹ :— it is intended for the parts above the clavicle, as in the dislocations of the lower jaw. Caraka² mentions a bandage called kavalikā, to be tied tightly after setting a fracture or reducing a dislocation. It is so-called from the medicinal paste which is applied to the affected parts, underneath the splints.

Dunglison mentions a bandage called Accipitar to be applied over the nose. It is so called from its likeness to the claws of a hawk. It resembles the pañcāṅgī bandage of the Hindus.

So the bandages are recommended to vary according to the different parts of the body ; and the surgeon, using his discretion, is to select the form of bandage suitable to the part. The bandages are recommended to be firmly secured to their place by three strings, applied upwards, downwards and obliquely. The knot is avoided over the seat of ulcer and tied on a side.

Suśruta says : “Bandages are applied with three degrees of tightness according to the seat of the abscess :—
 1. A tight bandage causes uneasiness but not actual pain ;
 2. A loose bandage is loose and relaxed ; 3. An even bandage is properly applied—neither tight nor loose. The tight bandage is to be applied to the buttocks, sides of the abdomen, axilla, groin, chest and head. The eyes and joints

¹ हन्तस्थिनी समानीय हनुसम्बौ विसंहर्ते ।

स्वेदयित्वा स्थिरं सम्यक् पञ्चाङ्गीं वितरेण्ड्रिष्ठक् ॥

Suśruta Saṁhitā, IV. iii.

² अस्थिभग्नं च्युतं सम्बिं संदधीत समं पूनः ।

समेन समभङ्गेन क्लतान्यन् विचक्षणः ॥

स्थिरेः कवलिकावस्थेः कुशिकाभिय संस्थितम् ।

पट्टैः प्रभूत सर्पिञ्जीवधीयाद्वलं मुखः ॥

Caraka Saṁhitā, VI. xiii.

are loosely bandaged. The even bandage is for the extremities, face, ears, neck, penis, scrotum, back, sides, and abdomen.”¹

Susruta next deals with the alterations in the mode of applying bandages according to the rules laid down. He also advises the surgeon to be guided by the dictates of his common sense. He directs us to practise bandaging on the various large and small limbs of a human figure made of cloth or clay.²

With regard to the mode of application of bandages, Hippocrates says :³ “It should be done quickly, without pain, with ease and with elegance, it should fit well and neatly. The forms of it are the simple, the slightly winding (called ascia), the sloping (sima), the monoculus, the rhombus, and semi-rhombus”.

The whole chapter of Susruta is very interesting and will repay perusal. If bodily transferred, it will adorn any modern text book on surgery.

As it is very difficult to convey a correct idea of these bandages in words, I have given figures of them from modern works on surgery, from which their construction and uses will be readily understood at a glance.

¹ तत्र ब्रणायतनविशेषाद्वन्ध विशेषस्त्रिविधो भवति गाढः समः शिथिल इति ।

पौड्यन्नरुजो गाढः सोच्छासः शिथिलः मृतः ।

नैव गाढो न शिथिलः समोवन्धः प्रकौर्त्तिः ।

तत्र स्फीक् कुच्चि कच्चावङ्ग्योरः शिरः सुगाढः । शाखावदन कर्णकण्ठसेन्द्रसुक्ष्मपृष्ठपात्रो-
दरस्मु समः । अच्चोः सम्प्रिषु च शिथिल इति ।

Susruta Samhitā, I. xviii.

² पुस्तमय पुरुषाङ्ग प्रत्यङ्गविशेषेषु वन्धयोग्य ।

Ibid, I. ix.

³ The Genuine Works of Hippocrates, Vol. II, P. 477. Syd. Soc. Ed.

ABDOMINAL BINDER.

Caraka¹ mentions the use of abdominal binder for the recently delivered woman to prevent derangement of air by its expansion in her abdomen.

Dr. Barnes says:² "The sudden expulsion of one-tenth of the body-weight from the abdominal cavity is attended by a sudden removal of a force hitherto pressing upon the vessels and organs of the chest, abdomen, and pelvis. This entails in some cases a tendency to vacuum. Hence disturbance of the circulation. Now the binder, by supporting the abdominal walls, restores the equilibrium of pressure. The pressure exerted upon the uterus works as a gentle continuous stimulus to contraction. The woman is conscious of the support and is grateful for it. The figure, so precious, and rightly so, to women, is better preserved So applied, the binder becomes one of the most efficient agents in antiseptic midwifery; it keeps the walls of the uterus and vagina in contact, thus preventing the collection of fluids or clots, and shutting out air".

The use of cloth for other surgical purposes is also mentioned :—

FIELD HOSPITAL.

The cloth is to be used for the manufacture of tents for the doctors to live in. The wounded in war are to be treated in such tents. The tent of the surgeon-general should be close to that of the king in the battle-field.³

¹ वैष्ट्येन्द्ररं महता वाससा तथा तस्या न वायुरुदरे विक्रितिमुत्पादयत्यनवकाश्वात् ।

Caraka Samhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II. p. 87.

³ स्तन्धावारि च महति राजगेहादनन्तरं ।

भवेत् सन्निहितो वैयः सर्वेषकरणान्वितः ॥

Small tents are also recommended for applying vapour bath to patients.

DRESSINGS.

Dīḍhavala¹ mentions the use of medicated gauzes to be used as sponge by the females and says : “In discharges from the vagina, piecees of cloth soaked in decoction of barks of Vata (*Ficus Bengalensis*) and Lodha (*Symplocos racemosa*) and dried, should be put inside the eanal.”

In the *Mohāvāgga*² we find the use of itch-cloth :— “I allow, O Bhikkhus, to whomsoever has the itch, or boils, or a discharge, or seabs, the use of an itch-cloth”.

“According to the 90th Pakittiya such cloth must not be more than four spans in length and two in breadth.”

I can not help quoting from *Mohāvāgga*,³ another discourse of Buddha as it shows clearly the surgical treatment of boils in aneient times :—

Now at that time a certain Bhikkhu had boils.

“I allow, O Bhikkhus, the use of the lancet”.

Decoctions of astringent herbs were required.

“I allow, O Bhikkhus, decoctions of astringent herbs”.

Sesamum salve was required.

तवस्थमिन धजवद्यशः ख्याति समुच्चितं ।

उपसर्पन्त्यमोहेन विषशल्यामयद्विताः ॥

Suśruta Saṁhitā, I. xxxiv.

¹ न्ययोधत्वक् कषायेण लोधकत्वक् तथा पिवेत् ।

आस्त्रावे चौमपट्ट वा भावितं तेऽनुधारयेत् ॥

Caraka Saṁhitā, VI. xxx.

² *Mahāvāgga*. VIII. 17, 2.

³ Ibid. VI. 14, 4 & 5.

“I allow, O Bhikkhus, the use of sesamum salve”.

5. Compresses were required.

“I allow, O Bhikkhus, the use of compresses.”

It was necessary to tie up the sore with cloth.

“I allow, O Bhikkhus, the use of bandages for tieing up wounds”.

The sore itched.

“I allow you, O Bhikkhus, the sprinkling of a sore with mustard-powder”.

The sore became moist.

“I allow you, Bhikkhus, to fumigate (the sore).”

Proud flesh formed on the wound.

“I allow you, O Bhikkhus, to cut off (proud flesh) with a lancet”.

The wound would not close up.

“I allow, O Bhikkhus, the use of oil for wounds”.

The oil ran over.

They told this thing to the Blessed One.

“I allow, O Bhikkhus, the use of fine rags, and of all kinds of ways of treating wounds”.

If the object of fumigating the sore was to sterilize it, as it certainly was, we may take this dialogue as the best sketch of the scientific treatment of boils,—remembering that it represents the knowledge of surgery more than 2500 years ago.

Cakrapāṇi advises us to tie the ends of the hairs of a patient, by a piece of cloth,¹ before performing phlebotomy on the vessels of the head and neck.

¹ सृष्टपद्मात्तकेशान्तो जानुस्थापितकर्परः ।

Cakradatta, Sirobyadhādhikāra.

4. CARMA OR LEATHER.

The use of leather in ancient medical practice in India was manifold.

Leather bandage.

Straps or belts of leather were used as bandages. Suśruta¹ advises us to apply the leather bandage in cases where more than half the thickness of the upper or lower extremities are cut by some sharp instruments in a slanting direction. Then the parts of the wound should be well adjusted, the bone and the soft parts kept in apposition, and the wound closed by sutures and well covered by dressings, over which the leather bandage is to be applied in the form of a gophaṇā or sling.

Leather bandage in the form of gophaṇā is mentioned by Suśruta² to be applied over the anus to prevent reoccurrence of procidentia of the rectum. The prolapsed bowl should be well bathed with ghee and fomented; and then reduced by gentle pressure. There should be a hole in the bandage just in front of the anus to allow flatus to pass out. Vṛnda³ alludes to it. Similarly the modern surgeons use a pad supported by a bandage as an aid in

¹ See foot-note 1, P. 178.

² गुदभंशे गुदं स्त्रिन् स्त्रेहाभ्यक्तं प्रवेशयेत् ।

कारवेदगोर्कणावन्धं मध्यच्छिद्रेण चर्मणा ॥

Suśruta Samhitā, IV. xx.

³ गुदभंशे गुदं स्त्रेहैरभ्यज्याऽशु प्रवेशयेत् ।

प्रविष्टं स्वेदयेच्चापि वद्धं गोःकणया भशम् ॥

गोःकणयेति । गोःकणा वन्धविशेषः ।

नक्तं हि:—उच्चारनिर्गमाय सच्छिद्रेण चर्मणा चास्य गोःकणावन्धः कार्य इति ॥

preventing descent of the gut. It is mentioned also in the Cakradatta¹ and the Yogaratnākara.²

Dṛḍhavala mentions the use of a piece of untanned leather to be applied over a layer of ointment during the day, while during the night the leaf of Eranda (*Ricinus communis*) is directed to be used.³

LEATHER LIGATURES.

In the treatment of snake-bite, a ligature is advised to be used above the seat of injury to stop the circulation of poisoned blood. This ligature is advised to be made of leather, or braided fibres of trees, or soft cord of jute, etc.⁴

YANTRA-ŚĀTAKA. LITHOTOMY STRAP OR BINDING APPARATUS.

This is the name of the leather shackle, which is recommended to be used during the operation for stone in the bladder. The patient should flex his knees and elbows; and the parts are to be

¹ गुदभंशे गुदं स्नेहैरथज्याऽय प्रवेशयेत् ।

प्रविष्टे स्वेदयेचापि वज्जं गोःफणया दृढम् ॥

Cakradatta, Kṣudraroga Cikitsā.

² गुदभंशे गुदं स्विन्नं स्नेहेनाक्तं प्रवेशयेत् ।

प्रविष्टं रोधयेदयनाद्रव्यसच्छिद्रं चर्मना ॥

Yogaratnākara, P. 343.

³ एरण्डपत्रैः प्रक्षाद्य रात्रौ कल्यं विमोचयेत् ॥

चीराम्बूणा ततः सिक्तं पुनश्चैवोपनाहितम् ।

सुच्चेद्रात्रौ दिवावज्जं चर्मभिश्च सुलोमभिः ॥ ६४ ।

Caraka Saṁhitā, VI. xxviii.

⁴ सञ्चेरेवादितः सर्पेः शाखादष्टस्य देहिनः ।

दंशस्त्रोपरि वस्त्रीयादरिष्टाशतुराङ्गुले ॥

प्रोतचर्माल्त-वल्कानां मदुनान्यतमेन च ।

न गच्छति विषं देहमरिष्टाभिर्निवारितं ॥

Suśruta Saṁhitā, V. v

tied together by this instrument.¹ Similarly, it is to be used during the operation for piles; but then, according to Suśruta,² the neck and thighs are to be tied by the instrument which is to be held firmly by the assistants. Vāgbhāṭa³ uses cloth instead of leather.

Yantra-śāṭaka is also to be used during the operation of phlebotomy. Suśruta says⁴: "If venesection is required to be done, the patient is to be seated on a stool, an aratni high (from the elbow to the end of the little finger), facing towards the sun. The thighs are to be flexed, the two elbows to be placed over the knees, and the hands (the fingers being clenched into fists) to be fixed on the two sides of the neck. The two ends of the shackle which pass over the fists, are held up at his back by the left hand of an assistant, who with his right hand steadily (neither forcibly nor loosely) presses above the part selected, to make the veins prominent, and at the same time rubs on the back to

¹ सङ्कुचितजानुकर्पुरमितरेण सहाववङ्गं सूत्रेण शाटकैर्बा ।

Suśruta Saṁhitā, IV. vii.

² वस्त्रकम्बलकोपविष्ट् यन्तशाटकेन परिचित्त गौवासकथं परिकर्मिभिः सुपरिगृहीत-
मस्पन्दनशरीरं कृत्वा ।

Ibid, IV. vi.

³

अथ यन्त्रेण वाससा ।

सकथौ शिरोधरायाच्च परिचित्त मृजुस्थितम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, IV. viii.

⁴ तत्र व्याध्यसिरं पुरुषं प्रव्यादित्यमुखमरविमात्रोक्तिने उपवेश्यासने सक्थौराकुच्छितयो-
निवेश्य कृपरसभिद्यस्योपरि हस्तावन्तर्गृद्वाङ्गुष्ठकतमुष्टी मन्यथोः स्थापयित्वा यन्तशाटकं
गौवामुष्टोरुपरि परिचित्यान्येन पुरुषेण पश्यात्स्थितेन वामहस्तेनोत्तानेन शाटकान्तर्दयं ग्राहयित्वा
ततो वैयो व्रूयाइत्तिणहस्तेन सिरोत्तापनार्थं नाथाधतशिथिलं यन्तमावेष्टयेत्यस्त्रक्सावणाये
यन्त्रं पृष्ठमन्थे च पीडयेति कर्त्त्यपुरुषच्च वायुपूर्णमुखं स्थापयेदेष उत्तमाङ्गतानामन्तम्भुख-
वर्ज्यानां सिराणां व्यधिग यन्त्रणविधिः ।

Suśruta Saṁhitā, III. viii.

stimulate bleeding, the patient being then told to inflate his mouth with air forcibly. This is the method of binding for puncturing the veins of the head except those (veins) which have their mouths turned inside the body". Vāgbhaṭa describes a similar procedure in bleeding from the vessels of the neck¹.

The Greeks also used ligatures to tie up the arms and legs of a patient in the lithotomy position. Paul² says: "In operating, the woman should be placed on a seat in a supine posture, having her legs drawn up to the belly, and her thighs separated from one another. Let the arms likewise be brought down to her legs and secured by proper ligatures about the neck".

In modern times, similarly, we use lithotomy straps or erutch, after placing the patient in the lithotomy position during the operation of lithotomy and excision of piles.

PĀŚA.

This is a different shackle to be used for binding insane persons.³

¹ अग्नितापातपस्त्रिग्वो जानूचासन संस्थितः ।

मदुपद्वासकेशान्तो जानुस्थापित कूर्परः ॥

मुष्टिभ्यां वस्त्र गर्भाभ्यां मन्त्रे गाढः निपीडयेत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvii.

² Paul. VI. lxxiii.

³ भीमाकारैर्नैर्नगैर्दलैर्बर्यालैश्च निर्विष्टैः ॥

भीषयेत् सततं पाशैः कणाभिर्बाध ताडयेत् ।

यन्त्रयित्वा सुपुत्रं वा चासयेत् दण्डिना ।

Suērūta Saṃhitā, VI. lxxii.

ABDOMINAL BINDER.

The use of cloth binder has been described before¹. Leather binder is to be used after the operation of paracentesis abdominis to apply pressure over the abdomen. After draining the fluid of ascites, the abdomen of the patient should be well wrapped with blankets, or silk cloth, or leather binder, for then the abdomen would not be flatulently distended by air.²

LEATHER BAGS.

The use of leather in the formation of bags of the vastiyantra has been described before³.

ŚIRO-VASTI. LEATHER BAG FOR THE HEAD.

For application of oil on the head, Suśruta⁴ directs us to use a goat's bladder filled with medicated oil, just in the same way as ice bags are used nowadays.

Śāringadhara⁵ describes another variety of śiro-vasti : "It is

¹ See P. 181.

² निःन्मुतेच दोषे गाढ़तरमाविक काशेय चर्मणामण्ठतमेन परिवेष्टयेदुदरं तथा नाभापयति
प्रसृतः ॥

Suśruta Saṁhitā, IV. xiv.

³ See P. 129-30.

⁴ ऋज्वासीनस्य वध्रौयाद् वस्तिकोषं ततो दृढ़ं ।

Ibid, VI. xviii.

⁵ शिरोवस्तिविधिशाव्र प्रीच्यते सुञ्जसम्मतः ।

शिरोवस्तिशर्मणः स्वाहिमुखो इदशाङ्गुलः ॥

शिरोप्रभाण्डं तं बडा मस्तके माषपिण्डकैः ॥

सन्धिरोधस्विधायादौ स्त्रेहैः कोणैः प्रपूरयेत् ॥

सावत् धार्यस्तु यावत् स्थानासानेचमुखस्तुतिः ।

बैदनोपश्मो वापि मावाणां वा सहस्रकम् ॥

Śāringadhara Saṁgraha, III. xi.

made of leather, has a length of twelve aṅguli and has two orifices or mouths. The leather bag is to be well tied round the head, the junction of the circumference of the bag and the skin should be well pasted with māṣa (Phaseolus Rox) glue. Then the cavity thus formed is to be filled with hot oily medicine. This is to be retained until the headache is relieved." Cakradatta¹ also mentions it. The bag is described to be sixteen aṅguli high in the Yogaratnākara². Vāgbhaṭa³ advises us to use leather of a cow or buffalo, and it is said to have been twelve aṅguli broad.

LEATHER BAND.

In phlebotomy, a band is advised to be applied above the spot where the vein is to be punctured. This band is recommended to be made of cloth, or jute, or leather, or barks of

¹ आशिरो व्यायतं चर्मं हृत्वा इन्द्रुलमुच्छितम् ॥
तेनावेष्य शिरोऽधस्तान्माषकल्केन लेपयेत् ।
निश्चलस्थोपविष्टस्य तैलैरुचौः प्रपूरयेत् ॥

Cakradatta, Siro-roga Cikitsā.

² आशिरो वापितचर्मं षोडशाइन्द्रुलमुच्छितम् ।
तेनावेष्य शिरोऽधस्तान्माषकल्केन लेपयेत् ॥

Yogaratnākara, P. 402.

- विधिस्थ निषमस्य पीठे जानुसमे मदौ ।
शुद्धाक्षिण्डेहस्य दिनान्ते गव्यमाहिषम् ॥
- इदशाइन्द्रुलविस्तीर्णं चर्मपटं शिरः समम् ।
- आकर्णं वम्बन स्थानं ललाटे वस्त्र वेष्टिते ।
- चैलवेणिकया वहा माषकल्केन लेपयेत् ॥
- ततो यथाव्याधि शृतं स्नेहं कोणं निषेचयेत् ।
- जह्नं किञ्चभुवो यावद्वाइन्द्रुलं धारयेच तम् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxii.

trees, or tendrils of twining plants¹; and it should not be applied either too tight or too loose. As for example, in phlebotomy in the foot, the yantra-sāṭaka or ligature should be applied below the knee-joint, while the band is to be tied round, at a distance of four aṅguli above the part selected for the operation.² Vāgbhaṭa³ says: “In phlebotomy, a band is to be tied round the upper extremity, four aṅguli above the spot selected for opening the vein which is to be made prominent by pressing it upwards with the closed fist.” Cakradatta⁴ also quotes it. Vāgbhaṭa⁵ recommends us to use a cloth band to be tied round the leg, four aṅguli above the spot selected for opening the vein in the leg.

This band corresponds to the band of Antyllus used by the Greeks. Antyllus applies a ligature of two fingers’

¹ गावं बजोपरि दृढं रज्जा पट्टेन वा सम् ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

वस्त्रपट्टचर्मान्तर्व्यक्तललतानामन्यतमेन यन्त्रित्वा नातिगाढं नातिशिथिलं शरीर प्रदेशमासाद्य यथोक्तं शस्त्रं गटहीला सिरां विध्येत् ॥

Suśruta Saṃhitā, III. viii.

² तत्र पादव्यधसिरस्य पादं समेस्यानि सुस्थिरं स्थापयित्वान्यं पादमीषतसङ्कुचितमुच्चैः क्षत्वा व्यध्यपादं जानुसम्बेरधः शटकेनावेष्य हस्ताभ्यां प्रपीडा गुल्फं व्यध्यप्रदशस्योपरि चतुरझुलम् झोतदौनामन्यतमेन वज्जां पादासिरां विध्येत् ॥

Ibid.

³ विधेऽस्तशिरां वाहावनाकुच्छित कूर्परे ।

वज्जा मुखोपविष्टस्य मुष्टिमङ्गुष्ठ गर्भिनीम् ।

जडं वेष्यप्रदेशाच्च घटिकां चतुरझुले ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvii.

⁴ Cakradatta, Śira-vvādhādhikāra.

⁵ पादे तु सुस्थितेऽधस्ताज्ञानु सम्बेनिं पौडिते ।

गाढं कराभ्यामागुल्फं चरणे तस्य चोपरि ॥

द्वितीये कुच्छिते किञ्चिदारुद्धे इस्तवत्ततः ।

वज्जा विध्येत् सिरामित्यमनुकूल्यपि कल्पयेत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvii.

breadth round the arm in bleeding at the elbow, while to bleed at the ankle, the band is to be applied at the knee. It is mentioned as fillet in the pseudo-Hippocratic treatise on Ulcers;¹ and Oribasius² gives an interesting dissertation on the subject, principally condensed from the works of Herodotus, Antyllus and Galen. Paul³ also ties a narrow band round some muscular part of the arm before abstracting blood from the inner part of the elbow. "Wherefore we must tie a narrow band around some muscular part of the arm, and having by friction of the hands upon one another produced the necessary fulness of the vein, we divide it transversely, but only along its breadth."

LEATHER BOTTLES, JARS, MAŞAKA, etc.

Leather was used in the manufacture of bottles and jars. Leather maşaka for honey, Soma juice, and dadhi (curdled milk), is mentioned in the R̄gveda⁴ and also in the Laws of Manu where

¹ Ulcers, iii. 328.

² Med. Collect., vii, Phlebotomy.

³ Paulus Aegineta. Adam's Trans. Bk. VI. Sec. XL.

⁴ दृतेरिव तेऽवकमस्य सख्यं ।

अच्छिद्रस्य दधन्तः सुपूर्णस्य दधन्तः ॥

R̄gveda, 6 M. 48 S. 4 A. 8 Ch. 18 v.

यो ह वां मधुनो द्विराहितो रथचर्षणे ।

ततः पिवतमश्चिना ॥

Ibid, 8 M. 5 S. 5 A. 8 Ch. 19 v.

चच्छिदं चम्बोभरं सोमं पविव आ सृज ।

नि धेहि गोरधि लचि ॥

Ibid, 1 M. 28 S. 1 A. 2 Ch. 9 v.

एष सीमो अधि लचि गवां क्रौड्यद्विभिः ।

इन्द्रं मदाय जोहुवत् ॥

Ibid, 9 M. 66 S. 7 A. 2 Ch. 29 v.

it is called dr̥ti¹. Leather maṣaka or inflated skins were in use as swimming bladders, and we have a representation of "figures with garlands in their hands, swimming and disporting themselves, supported on maṣaks or inflated skins."² In the R̥gveda, Agastya in his spell to neutralise poison, says:³ "I deposit the poison in the solar orb, like a leather bottle in the house of a vendor of spirits."⁴ Dr. Mitra points out that "other smṛtis ordain that oleaginous articles preserved in leather bottles do not become impure by the contact of the impure cowhide; and in the present day, jars of that material are in extensive use in Bengal and the North-West Provinces for the storage of oil and ghee. In the latter place, leather bags are universally used for raising water from wells, and

रुवति भौमो वृषभस्त्रविष्यथा शङ्के शिशानो हरिणी विचक्षणः ।
आ योनिं सोमः सुक्षतं नि बौदति गव्ययो त्वग्भवति निर्णिंगव्ययौ ॥

R̥gveda, 9 M. 70 S. 7 A. 2 Ch. 7 v.

एष स्य भानुरुद्दियर्ति युज्यते रथः परिञ्जमा दिवो अस्य सानवि ।
पृच्छासो अस्मिन्मिथुना अधि चयो द्वितीयूरीयो मधुनो वि रप्शते ॥

Ibid, 4 M. 45 S. 3 A. 7 Ch. 1 v.

See Wilson's R̥gveda, II. 28.

¹ इन्द्रियाणां तु सर्वेषां यद्येकं चरतौनिद्रियम् ।
ततोऽस्य चरति प्रज्ञा दृतेः पादादिवोदकम् ॥

Manu Saṁhitā, II. 99.

"But when one among all his organs fails, by that single failure his knowledge of God passes away, as water flows through one hole in a leathern bottle."

Ibid, Jones' Translation.

² Pl. xxxi. fig. 1. Fergusson's Tree and Serpent Worship, P. 127.

³ सूर्यं विषमा सजामि दृतिं सुरावतो गृह्णे ।

R̥gveda, 1 M. 191 S. 2 A. 5 Ch. 10 v.

⁴ Ibid. Wilson's Translation.

according to the law books of Saṅkha and Likhita,¹ that water is declared pure which is kept in old leather bottles”². To this may be contrasted the prevailing Hindu notion that water is defiled if touched by a Brāhmaṇa in his shoes. Though the leather is not allowed to be a material of dress of the Hindus, except his shoes which are considered as unclean, leather belts formed one of the eight sacred utensils necessary for a śramaṇa of the Buddhist order; and in the Manu Saṁhitā³ we find the students of theology advised to “wear for their mantles, the hides of black antelopes, of common deer, or of goats.”⁴

5. ANTARVALKALA. THE INNER BARKS OF TREES.

Barks of trees are recommended to be used as splints for the support of fractured bones. In fractures of bones of the foot, leg and thigh, Suśruta directs us to use splints made of barks of trees⁵ to surround the limbs. In the treatment of a simple fracture, Bhāva Miśra advises us to use cold water first, then mud is to be applied, and lastly the fractured bones should be secured

¹ आपो रूपवदगच्छवत्यः परिशुद्ध जीर्णचर्मकरण्डकैवभ्युद्धुताः ।
चर्मकरण्डः चर्मपुटः ।

Saṅkha and Likhita.

² Dr. R. C. Mitra's Indo-Aryans. vol. II.

³ कार्णीरौरववास्तानि चर्माणि व्रह्मचारिणः ।
वसीरन्नानुपूर्वण शाण्चौमाविकानि च ॥

Manu Saṁhitā, II. 41.

⁴ Ibid. Sir Wm. Jones' Translation. II. 41.

⁵ अभ्यज्य सर्पिष्ठापादं तन्मध्यं कुणीत्तरं ।
वस्त्रपट्टेन वधीशान्नच व्याघ्रमाचरित् ॥

Suśruta Saṁhitā, IV. iii.

by splints and bandages.¹ In the Yogaratnākara², we are advised to treat fraetures, by lowering the raised end and elevating the depressed end of the bone, and then by using splints and bandages to keep them in position. Bhāva Miśra³ describes it similarly after Suśruta. Suśruta direets us to use barks of Vata (Ficus Indica. Rox.) and bamboo strips as splints to support the neek after redueing its disloeatation by holding at the temporo-maxillary articulations on the sides and the occipital protuberance on the baek, and raising him up in the air. He should lie down with his head raised for seven days⁴. In modern times, the Sayre's suspension apparatus and jury mast serve the same purpose.

The barks of Mādhuka (Bassia latifolia), Aśvattha (Ficus religiosus), Kukubha (Terminalia arjuna), Polāśa (Butea frondosa, Rox.), Udumbara (Ficus glomerata; Rox.) bamboo, śāla (Shorea robusta), Vata (Ficus Indica. Rox.) are mentioned as

¹ आदौ भग्रं विदिला तु सेचयेच्छौतलाग्वुना ।

पङ्क्षनालिपनङ्कार्यं वस्त्रनच्च कुशन्वितम् ॥

Bhāva Prakāśa, II. iii. Bhagnādhikāra.

² पङ्क्षनालिपनं कुर्याद्वस्त्रं च कुशन्वितम् ।

अवनामितमुन्नाम्योदुन्नतं चावपौड़येत् ॥

चिस्मं दिधापि च स्थाने संस्थाप्य विधिमाचरेत् ॥

Yogaratnākara, P. 345.

³ अवनामितमुन्नाम्योदुन्नतञ्चावपौड़येत् ।

आच्छेदतिचिस्मधोगतञ्चोपरि वर्तयेत् ॥

Suśruta Saṁhitā, IV. iii.
Bhāva Prakāśa, II. iii. Bhagnādhikāra.

⁴ अवटावथहन्त्रीश्च प्रगृह्णीत्रमयेन्नरं ।

तथा कुशान् समंदत्तु वस्त्रपङ्क्षे न वेष्टयेत् ।

उत्तानं शाययेद्वै न सप्तरात्रमतन्त्रितः ॥

Suśruta Saṁhitā, IV. iii.

supplying the materials of splints¹. Bhāva Miśra² adds Kadamba (Anthocephalus cadamba), Hijjala (Barringtonia acutangnla), Sarja (Pinus longifolia) to the list. Such splints are called kuśa, and Vāgbhaṭa³ says that the splints should be broad, thin, pliant and clean.

Dr. Jacobi, of Dublin, says that he has seen an excellent splint made from the "fresh bark of a tree, taken off while the sap is rising". "It fits admirably", says he, "just like paste-board soaked in water"⁴. Dr. C. C. Jewet⁵ recommends for the same purpose the bark of leriodendron, or tulip tree.

THE CRUTCHES.

The crutches were used to help the crippled. In the Vajāsenīya Saṁhitā of the White Yayurveda, there is a passage describing the different kinds of human victims, appropriated to particular gods and godesses. The passage occurs also in the Taittiriya Brāhmaṇa with slight differences. There we

¹ मधूकोदुग्वराश्वत्य पलाश कुम्भलचः ।
वंशसर्ज्जवटानां वा कुशार्थसुपसंहरेत् ॥

Suśruta Saṁhitā, IV. iii.

² मधूकोदुग्वराश्वत्य कदम्ब निचुलवचः ।
वंशसर्ज्जर्जुनानाम् कुशार्थसुपसंहरेत् ॥

Bhāva Prakāśa, II. iii. Bhagnādhikāra.

³ कदम्बोदम्बराश्वत्यसर्ज्जर्जुन पलाशजैः ।
बंशोद्द्वै वा पृथुभि स्त्रुभिः सुनिवेशितैः ॥
सुम्भृत्यैः सुप्रतिस्तम्भै वंल्कलैः शकलैरपि ।
कुशाह्वयैः समं वन्मं पद्मस्योपरि योजयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxvii.

⁴ Hamilton's Fractures and Dislocations. 5th Ed. P. 50-51.

⁵ The 20th Mass. vols.

find “to the two (deities) who preside over the gains above or below one’s expectation (utkula and vikula), a eripple, who can not move even with the help of a eruteh” is recommended to be saerified. And again “to the divinity of land, a eripple who moves about on a eruteh.”¹

The use of the sound limb as a splint of support for the fraetured bone of the opposite side was well known. Wooden splints resembling in shape the injured member are also recommended. Suśruta says² that if the hand be fractured, it is to be tied with the opposite hand, but in fractures of both the hands, Gayadāssa³ recommends a wooden hand to be used as a splint for both. After union of the fractured bones, the hands should be made to hold balls of eow-dung, mud and stones.

6. LATĀ OR CREEPERS (TENDRILS OF).

The tendrils of creepers as materials of ligature are mentioned

¹ उल्कुलविकुलाभ्यां (उल्कुलविकुलेभ्यः) विस्थिनं ।

भूम्ये पौठसर्पिनमालभते ।

Taittirīya Brāhmaṇa.

Quoted in Mitra’s Indo-Aryans. vol. II. P. 84—85.

² उभे तले समे क्लता तत्त्वभग्नस्य देहिनः ।

वध्मीयादामतैलेन परिषेकच्च कारयेत् ।

प्राग् गोमयमयं पिण्डं धारयेन् मृणमयं ततः ।

हस्ते जातवलेचापि कुर्यात् पाष

॥

Suśrnta Saṅhitā, IV. iii.

³ गयौतु उभेऽपि हस्ततले तवेकस्य भङ्गे वामं दक्षिणं वामेन, उभयोस्तुभङ्गेन तत्समेन, काष्ठमयेन क्लता इ अपि वध्मीयादेवं दार्शः भवतीति, स्तपिण्डादिधारणमात्मकर्म्म प्राप्तर्थ्यम् ।

Quoted in Dallana’s Commentary, IV. iii.

by Suśruta. He recommends¹ to give up a patient, bit by a snake, as hopeless when he does not respond to the application of stimuli, such as cold water, tendrils of creepers, etc. Vāgbhaṭa² advises us to introduce the stalk of the lotus, with a thread tied to it, inside the throat to extract any foreign body stuck there. When the soft stalk is touched by the śalya, it should be extracted by the sudden withdrawal of the stalk and thread.

7. VASTRA OR CLOTH.

Cloth³ as a material of bandages, tents, gauze, etc. has been described before⁴.

8. ASTHILAŚMA. STONE OR PEBBLE.

It is a piece of stone—long and round. It is advised to be used for moving arrows fixed in the bone⁵. Caraka⁶ advises us to strike two pieces of stone against each other to resuscitate a

¹ अत्रीशं पित्तातप पोऽिनेषु वातप्रसिद्धेष्वय गर्भिनीषु ।

बद्धातुर चौणवभुचितेषु रुक्षेषु भीरुष्वय दुद्दिनेषु ॥

शस्त्रचते यस्य न रक्तमस्ति राज्योत्तामिश्र न सम्भवन्ति ।

शोतमिराह्लिश न राम हर्षी विपामिभूतं परिवर्जयेत् ॥

Suśruta Saṁhitā, V. iii.

² कण्ठस्तोगते श्ल्य सूत्र कर्णे प्रवेशयेत् ।

विसेनाते ततः श्ल्य विसं सूतं समं हरेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

³ वस्त्रं प्रसिद्धं तूलकं सूत्रनिर्भितं वेष्टनार्थं प्रयुज्यते ॥

Vagbhataṛtha Kaumudī, I. xxv.

⁴ See P. 176-83.

⁵ अग्नप्रस्तरखण्डं शस्त्रपीडनार्थं निर्धातनात्र युज्यते ॥

Ibid.

⁶ अग्नानाः संघटनं कर्णयामुले शोतोदकैनाशोदकेन वा सुखपरिषेकः ।

Caraka Saṁhitā, IV. viii.

still-born child. In bleeding from the veins of the neck, Vāgbhaṭa¹ advises the patient to hold firmly two pieces of stones in their hands.

A piece of stone is to be used by a person, for holding it with his hand, after recovery from fractures of the carpal and metatarsal bones².

In ancient times, in India, the kings used to decorate themselves with antidotal gems, as a safeguard against poisons.³ Even now the snake charmers apply a black stone on their bodies where they are wounded by the venomous reptile. This stone is popularly known as the viśa-pāṭhara or poison-stone, and is supposed to have the property of extracting poison from the body.

9. MUDGARA. HAMMER.

Suśruta directs us to use a hammer or a piece of stone to strike an arrow firmly fixed in the bone, until loosened, when it can be conveniently extracted by means of a pair of forceps⁴. It should be pointed out that the tubular instrument—śalya

¹ पाषाणगम्भेहस्य जानुस्ये प्रस्तृते भूजे ।
कुचेरारभ्य सृदिते विश्वेदङ्गोऽपदृक्ते ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvii.

² See foot-note. 2. P. 196.

³ विषन्नैरूद्रकै स्नातो विषन्नमणिभूषितः ।
परीक्षितं समश्रीयामगाङ्गलाविहिषणवृतः ॥

Kāmandakīya Nītiśāra, Ch. vii. v. 10.

रचितो गडुरोङ्गार मणियस्य विभूषणं ।
स्थावरं जङ्गमं तस्य विषं निर्बिधिता ब्रजेत् ॥

⁴ अस्थिदेशोत्तुण्डित मष्टीलाश्ममुह्नराणामन्यतमस्य प्रहारेण विचाल्य यथामार्गमेव।

Suśrūta Saṃhitā, I. xxvii.

nirghātānī—described before¹, served the same purpose. Vāgbhaṭa also uses a hammer² to shake an arrow fixed in the bone, and directs us to extract it with the hands or by the various kinds of foreeps³.

The Greeks used some iron instrument to shake such an arrow from the place where it was lodged. The hammer was also used by the Greeks and Romans but in a different capacity. Paul mentions its use in cranial surgery to strike the lenticular and gouge⁴. Paul and Celsus describe a “method of extracting foreign bodies from the ear by laying the patient on a board and striking the under side with a mallet.”⁵ Vāgbhaṭa describes this method for draining out water from the ear.⁶

10. PĀNIPĀDATALA. THE PALM OF HAND AND SOLE OF FOOT.

11. AṄGULI OR FINGERS.

The surgeon's hand is considered by Suśruta to be the principal instrument as the use of all other instruments depends

¹ See P. 111.

² सुङ्ग्राहतया नाड्या निर्धात्योचुण्डितं हरेत् ।

तैरेव चानयेन्मार्गमार्गेचुण्डितं तु यत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

³ अथाहरेत् करप्राप्य करण्णवेतरत् पुनः ।

दृश्यं सिंहाद्विकरवर्मि कर्कटकाननैः ॥

अदृश्यं ब्रण्णसंस्थानाद् यहीतुं शक्यते यतः ।

कद्भ भृङ्गाह कुरर शरारी वायसाननैः ॥

Ibid.

⁴ Paulus Aegineta VII. xc.

⁵ Milne, Graceo-Roman Surgical Instruments, p. 125.

⁶ कर्णेऽग्नुं पूर्णे हस्तेन मथिला तैलवारिणी ।

चिपेदधोमुखं कर्णं हन्यादा चूषयेत वा ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

upon it¹. But again he mentions the hand and foot as accessory to, or substitutes for, the instruments. Longmore² says: "Of all instruments for making a complete examination of a gun-shot wound as well as for exploring for foreign bodies which may be lodged in it, the finger of the surgeon is the most appropriate, whenever a wound is large enough to admit of its insertion." There are many instances of the use of hand and foot in the treatment of surgical diseases but I shall point out a few of them.

1. Both Suśruta³ and Cakradatta⁴ say that "if a swelling be hard but slightly painful, then it should be well fomented, pressed and rubbed by a piece of bamboo, or palm of the hand, or thumb to cause its subsidence. Bhāva Miśra also quotes this verse⁵. Suśruta⁶ and Vāgbhīṣṭa⁷ recommend a similar treatment for enlarged glands.

¹ See foot note, P. 90.

² Longmore, Gun-shot Injuries, 1877, P. 319.

³ अभ्यज्य स्वेदयित्वा तु वैणुना वा श्नैः श्नैः ।
विमर्द्द्येहिष्प्रक् प्राज्ञलेनाङ्गुष्ठकीन वा ॥

Suśruta Saṁhitā, IV. i.

⁴ अभ्यज्य स्वेदयित्वा च वैणुनाद्याततः श्नैः ।
विन्नापनार्थं स्फ्रीयात् तत्त्वेनाङ्गुष्ठकीन वा ॥

Cakradatta, Vraṇāśotha Cikitsā.

⁵ अभ्यज्य स्वेदयित्वातु वैणुनाद्या श्नैः श्नैः ।
विमर्द्द्येहिष्प्रडमन्दन्तनेनाङ्गुष्ठकीन वा ॥

Bhāva Prakāśa, II. iii.

⁶ हनेषु दोषेषु यथानपूर्वं गच्छौ भिषक् श्वी प्ल ससुख्यनेतु ।
सिन्धस्य विन्नापनमेत्र कुर्यादङ्गुष्ठलोहोपलविण्डदग्धैः ॥

Suśruta Saṁhitā, IV. xviii.

⁷ संस्वेद्य वहशीयस्थिं विस्फ्रीयात् पुनः पुनः ।

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxx.

2. Suśruta says¹ that “when a morsel of food sticks in the throat, a blow should be fearlessly struck with the fist on the shoulder of the patient without his knowledge”. Vāgbhāṭa² also describes it.

It is however curious to find that exactly the same procedure was adopted by Alsaharavius. Adams in his commentary³ on Paul says that “when a morsel of food sticks to the oesophagus, Alsaharavius directs that the person should be struck on the back, which will facilitate the descent of it”.

3. In the reduction of dislocation of the lower jaw, Caraka used his fingers to do it exactly in the same way as recommended by the modern surgeons. He directs us to depress the lower jaw by the thumbs and at the same time to raise the chin by the index fingers⁴. The verses are quoted by Cakradatta.⁵ The description of the method, quoted from any modern text book, would be a good commentary on the above passage of Caraka. Erichsen says⁶: “The reduction is best effected, by the surgeon,

¹ ग्रासश्चयेत् कण्ठासक्ते निःशङ्कमनुवृद्धक्षम्ये मुष्टिनाभिहन्यात् खेहं भयं पानीयम् वा पाययेत् ।

Suśruta Samhitā, I. xxvii.

² अप्यान स्तम्भधाताभ्यां ग्रासश्चये प्रवेशयेत् ।

Aṣṭāṅga Hṛdaya Samhitā, I. xxviii.

³ Adam's Commentary on Paulus Aegineta, VI. xxxii.

⁴ व्यात्ताने हनुं स्थिनमङ्गुष्ठाभ्यां प्रपीड्य च ।

प्रदेशिनीभ्याच्छोन्नम्य चित्तकोन्नमनं हितं ॥

स्त्रां सङ्गमयेत् स्थानं स्त्रां स्थित्रं विनासयेत् ।

प्रवेकं स्थानदूषादिक्रिया दैर्घ्यमाचरेत् ॥

Caraka Samhitā, VI. xxviii.

⁵ Cakradatta, Vātabyādhi Cikitsā.

⁶ Surgery, Vol. II, p. 658.

standing before the patient, placing his thumbs, well protected by napkins, or a few turns of a narrow bandage, on the molar teeth on each side, and then depressing the angles of the jaw forcibly, at the same time that he raises the chin by means of his fingers spread out and placed underneath it.”

4. Caraka says¹ : “After pairing her nails and covering the tip of her index finger with cotton, the nurse is to clean the palate, lips and throat of the new-born child”.

With this passage we may compare what Barnes says on the point². “The attendant having then placed the child close to the mother, so as to avoid any strain on the cord, should cleanse its mouth from any fluids, such as blood and mucus, it may have partially swallowed during its passage through the vagina. This should be done at once, as such fluids drawn into the lung vesicles may give rise to inflammation of the lungs, or even septicæmia.”

5. Suśruta³ recognises “six modes of diagnosing diseases, namely by the five senses *i.e.* by hearing, smell, taste, sight and touch, and by questions. “Symptoms discernible by the sense of touch are coolness or heat, smoothness or roughness, softness or hardness, and other tangible qualities of the skin in fever, dropsy,

¹ अथास्य ताल्लोष्टकण्ठं जिह्वाप्रमार्ज्जनमारभेत् अङ्गुल्यासुपरिलिखितनखया सुप्रचालितो-पघानकार्पासपिचुमत्या प्रथमं प्रमार्ज्जितस्यास्य च शिरसालु कार्पासपिचुना स्त्रेहगर्भेन प्रतिच्छादयेत्।

Caraka Samhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II, p. 105.

³ षड्धृधो हि रोगाणां विज्ञानोपायः। तद्यथा पच्चमि शोवादिभिः प्रश्नेन चेति।

* * * * स्पर्शनेन्द्रियविज्ञेयाः श्रीतोष्णशक्त्या कर्कशस्त्रुकठिनल्वादयो ज्वरशोफादिषु।

and other diseases.” And we know how important it is to educate the tactile sense in the diagnosis of diseases.

6. The foot is recommended to fix a part of the human body whence any foreign body may be removed easily by the hands.¹ Suśruta says²: “If a foreign body cannot be easily extracted, as when it is impacted in the hollow or the substance of a bone, the part should be pressed by the feet, and it should be drawn out by the instrument.” Vāgbhaṭa also gives a similar description³. Caraka describes a method of removal of the placenta if not spontaneously separated. One of the female attendants should press upon the navel of the peurpera forcibly with her right hand, while with the left hand placed upon her back, she should shake her. Then the heel is to be placed on the patient’s buttock while the two sides of the gluteal regions are also to be pressed and shaken⁴.

12. JIHVĀ OR TONGUE.

The organ of taste as a means of diagnosis is noted by

¹ पाद इति पादेन शरीरदेशं ध्रुवा हस्तादियन्ते ए उद्वरणादि क्रियते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

² अस्थिविवरप्रविष्टं अस्थिविदष्टं वाऽवगट्ह्य पादाभ्यां यन्ते णापहरेत् ।

Suśruta Saṁhitā, I. xxvii.

³ अस्थिदृष्टे नरं पदभ्यां पौड़यित्वा विनिर्झरेत् ।

इत्यशक्ये सुवलिभिः सुगृहीतस्य किञ्चरैः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

⁴ तस्याश्चेदमरा न प्रपन्ना स्यादथैनामन्यतमा स्वौ दच्चिणेन पाणिना नाभेरुपरिक्षाहलवत् निपौद्य सब्येन पाणिना पृष्ठत उपसंगट्ह्य मुनिर्जितं निर्जुनयात् । अथास्याः पादपार्षद्ग्र-श्रीणीमाकोटयेदस्याः स्फिचाबुपसंगट्ह्य मुपौड़ितं पौड़येत् ।

Caraka Saṁhitā, V.

Suśruta¹. “Symptoms discernible by the sense of taste are the various tastes noticeable in morbid secretions of urine and other diseases”. Cakrapāṇi “explains that ‘inference’ is necessary, because the sense of taste can not be exercised by the physician on the patient directly;”² he must do it through some intermediate agents such as ants, whose attraction to sugar is well-known and so the presence of sugar in urinary diseases can be inferred.”

13. DANTA OR TOOTH.

Ivory as a material of surgical instruments has been described before³. Suśruta⁴ advises us to use the ash of ivory with stibium as a stimulant to the growth of hair on a scar. It is also recommended by Vāgbhāṭa⁵.

14. NAKHA OR NAILS.

Suśruta advises the surgeon to use his nails⁶ for the operation of cutting, piercing and extraction, if these can be possibly helped by his nails.

In modern times, nails often help the surgeons in separating

¹ रसनेन्द्रिविज्ञेयः प्रमेहादिषु रसविशेषाः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. x.

² Hærnle's Commentary on the Suśruta Saṁhitā, I. x. (Bibliotheca Indica).

³ See page 67.

⁴ हस्तीदल्मसर्वे कृवा सुख्यच्चैव रमाङ्गनं ।

रोमाख्येतेन जाग्रत्वे लिपाऽपानितनिष्पिः ॥

Suśruta Saṁhitā, IV. i.

⁵ तैलाक्ता हस्तिदल्मस्य मध्यी वा चौषधं परम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxiv.

⁶ आहार्यक्षेयमेयेषु नखं शक्येषु योजयेत् ।

Suśruta Saṁhitā, I. viii.

layers of tissues during operation as in the operation for the radical cure of hydrocele. We often extract thorns, impaeted in our body, with our nails.

15. MUKHA OR MOUTH.

The use of mouth as a suction apparatus was well known to the ancients. Suśruta advises us to use ārā or pāñimantha (awl) to perforate bone in diseases of the medullary canal, caused by obstructed and deranged air. He next introduces one end of a tube, open at both ends, into the canal through the perforation in the bone, while through the other end the surgeon sucks out air by his mouth¹. The use of mouth for sucking out air through the śringa or horn has been described before². Caiaka says³ that the poison of a snake-bite may be sucked out by the surgeon's mouth, filled with flour or ash. Even in modern times, it is common amongst Indians to suck out blood, in accidental cuts by knives, by the mouth. The practice of the suckers in Europe has been noted before⁴.

16. VĀLA OR HAIR.

Horse-hair is to be used for applying ligatures round the piles⁵. It is also a material of suture for the skin. Horse-hair is also described to have been used for raising pterygium. Paul⁶ also used horse-hair to raise a pterygium.

¹ निरुद्धे स्थनि वा वायौ पाणिस्थेन दारिते ।
नाडीं दत्तास्थनि भिषक् चृष्टयेत् पवनं वली ॥

Suśruta Saṁhitā, IV. iv.

² See P. 148-49.

³ दंशं वा चूपेन्मूखेन यवचूर्णपांगुपूर्णेन ।

Caraka Saṁhitā, VI. xxv.

⁴ See P. 149-50.

⁵ वालाः, अश्यादीनां पूर्क्षभवकेणा नृकेणाश्च अर्णो वाल्यादि वस्त्रनार्थः युज्यते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

⁶ Paulus Aegineta, VI. xviii.

Suśruta¹ says: "Bundles of hairs or tents are to be used in the treatment of wounds in the skull, formed by the extraction of an arrow from the brain. These would prevent the hernial protrusion of the cerebral substances from passing out through the wound. The hairs are to be removed one by one, as the wound heals up gradually." Vāgbhaṭa² also approves this treatment.

A bundle of hairs tied to a long thread is mentioned by Suśruta to have been used for the extraction of fish-bones from the throat³. The patient is directed to swallow the ball of hairs with some liquid. Next emetics are to be administered to excite vomiting. During this act, the foreign body gets entangled in the meshes of the ball, which being then suddenly pulled out by the thread outside, extracts the fish-bone satisfactorily. Vāgbhata⁴ also describes it similarly. For this purpose

¹ शिरसोऽपहृते शल्ये वालवर्ति प्रवेशयेत् ।

वालवर्त्यमदनयां मस्तुलुङ्गं त्रणात् स्ववेत् ॥

Suśruta Saṃhitā, IV. ii.

² कार्या शल्याहृते विञ्जे भङ्गाद्विदलिते क्रिया ।

शिरसोपहृते शल्ये वालवर्ति प्रवेशयेत् ॥

मस्तुलुङ्गसुते कुञ्जी हन्यादेन चलोऽन्यथा ।

त्रणे रोहति चैकैकं शनैरपनयेत् कचम् ।

मस्तुलुङ्गसुतौः खादेन्मस्तिष्कानन्यजीवजान् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, VI. xxvi.

³ अस्थिशल्यमन्यदा तिर्यक्कण्ठासक्तमवेच्चा केशोङ्गुकं दृढैक सूतवद्धं द्रवभक्तोपहितं पययेदाकस्थाच्च पूर्णकोष्ठं वामयेद्विमतश्च शल्यैकदेशसक्तं ज्ञात्वा सूतं सहसा त्वाचिपेत् ।

Suśruta Saṃhitā, I. xxvii.

⁴ कोशोन्दुकेन पौत्रेन द्रवैः कन्टकमाचिपेत् ।

सहसा सूतवहेन वमत सेन चेतरत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

a tooth brush formed by chewing the end of a narrow branch of a tree is also recommended¹. A common domestic remedy is to make the patients swallow large morsels of boiled rice, plantain, etc.

Paul² mentions a similar contrivance, and says: "Some are of opinion that the patient ought to be made to swallow large morsels, such as stalk of lettuces or pieces of bread ; but others direct us to bind a thread about a small piece of clean soft sponge and give it to the patient to swallow, and then taking hold of the thread to draw it up, and to do this frequently in order that the thorn may get fixed in the sponge and be brought up". For this purpose Aetius used the epilation forceps. Paul calls it acanthobolus or the fish-bone forceps.

The modern surgeons use a probang for the same object. "Small sharp bodies, such as bristles, fish-bones, or pins, are generally found sticking between the pillars of the fauces and the tonsils." Such bodies "should not be pushed on, but an endeavour should be made to catch them with the "horse-hair probang." This being pushed gently, unexpanded, beyond the point where the pin or bone is stuck, is expanded by pulling up the handle and then withdrawn with a slight rotatory motion."³

Caraka⁴ mentions the practice amongst the recently delivered

¹ मृदुना वा दन्तधावनकुच्चिकेनापहरेत् ।

Suśruta Saṁhitā, I. xxvii.

² Paulus Aegineta, VI. xxxi.

³ Swain's Surgical Emergencies, 3rd ed., Pp. 32-33.

⁴ अथास्या वालवेण्या कण्ठतालु परिमुशेत् ।

Caraka Saṁhitā, IV. xviii.

women to push a braid of her hair into her throat, to help the expulsion of the placenta. So in the Yogaratnākara¹, her throat is advised to be rubbed by a finger surrounded by hairs. This practice is still prevalent among the women of Bengal to a certain extent.

SUTURE MATERIAL.

Horse-hair was the material used by the Hindus for sutures. Besides it, they used² sutures of fine thread, or the fibres of the bark of Aśmantaka (*Cæsalpina digynia*), or threads made of hemp or flax, or of the fibres of which bow-strings were made, or of the fibres of the Mūrvvā (*Sansevieria zeylanica*) or Guḍūcī (*Tinspora cordifolia*). Besides these, the Hindu surgeons used the mouth parts of the ants as clasps to close incisions on the intestines. Suśruta³ describes the use of living black ants to close the incisions on the walls of the intestines, during the operation for intestinal obstruction, after removing the scybali, stones, etc. He advises us to remove the bodies of the ants, leaving their heads fixed on the margins of the incision,

¹ केशवेष्टियाङ्गुला तस्याः करणः प्रघर्घयेत् ।

Yogaratnākara, P. 437.

² सौव्येत् सूक्ष्मोण सूतेण वल्केनाशमन्तकस्य वा ।

सनजच्छौमसूताभ्यां स्नायु वालेन वा पुनः ॥

मूर्खागुडुचीतानैर्वा ।

Suśruta Sāhītā, I. xxv.

स्नायु सूतेण वल्कलैः ।

सौव्येन्न दूरे नासन्ने गद्धान्नाल्यं न वा वहु ॥

Aṣṭāṅga Hṛdaya Sāhītā, I. xxix.

³ परिसाविख्याप्तेवमेव शल्यमङ्गुत्यान्वसावान् मंशोध्य तच्छ्रद्धसन्त रसमाधाय कृष्णपिपीलिकाभिर्देशयेत् इष्टे च तासां कायानप्तहरिन्न सिरांसि ततः पूर्ववत् सौव्येत् ।

Suśruta Sāhītā, IV. xiv.

in the act of biting. Then the intestines should be replaced with the ants' heads sticking to them. Caraka¹ also describes the use of ants for obliteration of small perforations in the intestines, but he takes away the ants before replacing the gut into the abdominal cavity. If by any accident, the abdominal muscles be incised and the intestines come out of a gaping wound, Suśruta recommends us to allow black ants to bite the exposed ends of intestines before replacing them into the abdomen². This is a curious practice of ancient surgery of the Hindus. The Greeks and Arabs never mentioned it. "Amongst some Indian tribes, it is customary to allow both edges of a wound to be seized by the sharp head-nippers of certain ants, whose bodies are then rapidly cut off; one ant after another being used, the wound is closed."³

Suśruta describes four sorts of sutures, *viz.*:

1. Vellitaka or winding.
2. Gopanikā or like a sling.
3. Tunna sevanī or continued sutures.
4. R̄jugranthi or interrupted sutures.

¹ क्षिद्राग्णक्तस्य तु स्यूलैदेंशयिता पिपीलिकैः ।
वहशः संगट्हीतानि मत्वा च्छिला पिपीलिकान् ।
प्रतियोगैः प्रवेश्यान्तं वह्निः सौव्येदं ब्रणं ततः ॥

Caraka Saṁhitā, VI. xviii.

² अभिन्नमन्तं निष्क्रान्तं प्रविश्य नान्यथा भवेत् ।
पिपीलिकाशिरोग्रसं : तदाप्ये के वदनि तु ॥
प्रचाल्य पथसा दिघं लणशोणित पांशुभिः ।
प्रविश्येत् क्लृतनखो दृतेनाक्तं श्नैः श्नैः ॥

Suśruta Saṁhitā, IV. ii.

³ Neuburger's History of Medicine, Playfair's Translation, Vol. I., P. 9

These are advised to be so applied as they may suit the different parts of the body¹. The needles must not be introduced either too far from, or too close to the edges of the wound. In the former ease, the lips of the wound shall be inflamed and so cause pain, while in the latter, the sutures will give way”.

The use of horse-hair as a material for suturing wounds was unknown to the Greeks and Romans. They used sutures of flax and woollen threads for wounds. Paul says: “Afterwards we unite the seperated parts with a needle eontaining a woollen thread, being satisfied with two sutures.”² Celsus³ advises us to use sutures of soft thread; and the apolinose of Hippoerates⁴ is direeted to be made of crude flax.

17. AŚVAKATAKA. THE RING OF A HORSE'S BRIDLE.

Suśruta says that when the arrow is firmly fixed in the bone and if it can not be extraeted by foreible pulling by hands or instruments, it should be tied to the ring of a horse's bridle. Then the animal is to be whipped, when by the sudden movement of the horse, the weapon would be jerked out of the wound⁵.

18. ŚĀKHĀ OR BRANCH OF A TREE.

Another method is to tie such an arrow by means of a rope

¹ सौव्येदेल्लितकं शनैः ।

सौव्येद्वीफणिकां वापि सौव्येहा तु नुमेवनीं ।

ऋग्यन्यिमयो वापि यथायोगमयापि वा ॥

Suśruta Saṁhitā, I. xxv.

² Paulus Aegineta, VI. xii. Adam's Translations.

³ Celsus, V. xxvi.

⁴ Hippocrates, iii. 132.

⁵ अभ्युवक्तकटके वा वध्नीयादथैनं कशया ताड्येयग्रीवमयन् शिरोविगेन शत्यसुद्धरति ।

Suśruta Saṁhitā, I. xxvii.

to the branch of a tree, lowered by pressure¹. When the pressure is released, the branch suddenly goes high up, and thereby it pulls the weapon out of the wound². Dallana, however, mentions another view that a bridle-ring and a branch of a tree are both required for the extraction of foreign bodies³. Hœrnle remarks : “The branch apparently is put through the ring to afford a stronger pull”⁴. Vāgbhāṭa⁵ also mentions these contrivances.

19. STHIVANA OR SPITTLE.

Dallana⁶ understands by it—“ throwing out expectoration and saliva by the mouth.” By this means any foreign body lodged in the oral cavity, such as in the gums, fauces, may easily be got rid of.

¹ दृढां वा वृच्छाखामवनस्य तासां पूर्ववदवज्जोड्वरेत् ।

Suśruta Saṃhitā, I. xxvii.

² शाखा, वृच्छाखा, वह्नायास विनमिताथां शाखायां शल्याग्रभागं दृढं वज्जा, सहसा शाखायागेन उक्तितया शाखया शल्यसुनियते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

³ अन्ये त्वेवं पठन्ति अशक्यमेवं वा वलवज्जः सुपरिग्रहितस्य यन्वे यैनं ग्राहयित्वा शल्य-मावज्जं प्रविभूज्य धनुर्गुणैर्बैकतःशाथाश्ववक्रकटके वधीयात् । अथैनम् इत्यत्र कारकेक पाठः कश्या ताड़येत् यथोन्नमयन् शिरोवेगेन शल्यसुद्देहरति, नमितायां पञ्चाङ्गां वृच्छाखायां व पूर्ववद वज्जोड्वरेदिति ॥

Nivandha Saṃgraha, I. xxvii.

⁴ The Suśruta Saṃhitā. Bibliotheca Indica. P. 48. foot note 109.

⁵ तथाप्यशक्ये वारङ्गं वक्रीकृत्य धनुर्जय्या ।

सुवज्जं वक्रकटके वधीयात् सुसमाहितः ॥

मुसंयतस्यः पञ्चाङ्गा वाजिनः कशायथ तम् ।

ताड़येदिति मूर्झानं वेगेनोन्नमयन् यथा ॥

उज्जरेच्छल्यमेवं वा शाखायां कल्पयेत्तरोः ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxviii.

⁶ ष्टीवणं श्रीमादिनिरसनम् ।

Nivandha Saṃgraha, I. vii.

20. PROVĀHANA OR FLUXING THE PATIENT.

This comprises the acts of emesis, purgation and lacrymal secretion. Thus the foreign bodies lodged in the alimentary canal or eyes may be got rid of by causing discharges from the bowels, the stomach, or the eyes¹.

21. HARŚA OR OBJECTS EXCITING HAPPINESS.

Persons suffering from vrāṇa or wound are directed to have their minds in a state of cheerfulness by the sight of objects exciting happiness². A cheerful man is a better subject for a surgical operation than a morose and gloomy one. Vāgbhaṭa³ adds fear as an accessory instrument. Joy and fear cause a sudden change in the temper of a man and so may be of some help in curing diseases⁴. Suśruta regards, sorrow as a śalya or foreign body which is to be removed by joy.⁵

22. AYĀSKĀNTA OR LOAD-STONE.

Magnet was known to the ancient Hindus⁶ and they used it

¹ तवाशुचवथूङ्कार कास मूत पूरोषानिलैः स्वभाववलप्रहृतै नयनादिभ्यः पतति ।

Suśruta Saṁhitā, I. xxvii.

² सुहृदो विचिपन्त्यागु कथाभिर्बणवेदनाः ।

आश्वासयन्ती वहुशस्त्रनुकूलाः प्रियम्बदाः ॥

* * * *

सम्पदाद्यनुकूलाभिः कथाभिः प्रौतिनानन्सः ।

आशावान् व्याधिमोक्षाय चिप्र' सुखमवाप्नुयात् ॥

Suśruta Saṁhitā, I. xix.

³ See foot-note 1, P. 98.

⁴ भय हृषीं शरीरस्य सहसा भावान्तरसुत्पादयन्तौ यन्त्रकार्यं कुरुत इति ।

Vāgbhaṭārtha Kaumudi, I. xxv.

⁵ हृदयवस्थित मनेक कारणोत्पन्नं शोकशल्यं हृषेणेति ।

Suśruta Saṁhitā, I. xxvii.

⁶ मणिगमनं सूच्यभिर्संप्रणमद्वकारणकं ।

Vaiśeṣikā Darśanam, Ch. V. Ālmīka 15.

to extract minute foreign bodies such as iron particles from the eyes and teeth. Suśruta¹ also mentions its use for extracting an arrow from the wound, if it be without barbs.

In modern times, a magnet is still used for removing a particle of iron from the eye. "Indeed, cases have occurred in which the application of an inch bar-magnet connected with four Grove's cells to the outside of the cornea has caused the foreign body to retrace its course and emerge through the wound"². A fragment of iron lying in the vitreous has been removed by the Snell's electro-magnet introduced through the scleral wound behind the ciliary region. "The following plan of ascertaining whether a portion of needle be really impacted has been suggested by Marshall, and successfully carried into practice by Littlewood of Leeds. A powerful magnet is to be held upon the part for a quarter of an hour, so as to magnetise the fragment; a firmly hung polarised needle should then be suspended over it, when, if any iron is present, deflection will ensue."³

23. KṢĀRA. CAUSTICS OR POTENTIAL CAUTERY.

Caustics were highly extolled by the ancient surgeons as the external applications are better tolerated by the weak and

सूचभिसंपर्णमिति सूचीपदेन लौहमात्रं दृणच्चोपलक्षयति: तथा चायस्कान्ताभिसुखं
यत् सूचादेर्गमनं * * * * *

Sāṅkara Miśra, Upaskāra.

¹ अनुलोभमनववइकर्णमनल्प ब्रणसुखमयस्कान्तेन।

Suśruta Saṁhitā, I. xxvii.

² Carter's Ophthalmic Surgery, 2nd ed., P. 369.

³ Erichsen's Surgery, Vol. I, P. 343.

timid persons who are afraid of the surgeon's knife¹; though Suśruta² distinctly states: "The following persons should not be treated with caustics: weak people, children, old and timid people, etc." They even give them preference to the knife for they argue that surgical diseases are radieally cured by the application of the caustics, without any possibility of recurrence. Suśruta says³: "Of all cutting instruments and their substitutes, caustics (or vegetable alkalis) are the most important, because by means of them deep and superficial incisions and scarifications may be made, derangements of the three humours may be rectified and some diseases can be treated with special advantage."⁴

For the preparation and uses of caustics, see the Suśruta Saṁhitā, I. xi.

For the application of potential cauteries, three classes of instruments are recommended.⁵

1. Darvī—it is to be made of wood and should resemble a spoon in appearance.

¹ अत्यस्त्वेऽवले वाले पाके चातर्थ्यं सुद्धते ।

दारणं मर्मं सन्धादिस्थिते चान्यत पाटनं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxix.

² अथनैते चारकात्याः । तद्यथा दुर्ब्लवाल स्थविर भीरुसर्वाङ्ग श्नोदरि रक्तपित्ति-गार्भिन्युत्तुमती प्रवृद्धज्वरि प्रमेहोरः चतचौनटशा मूर्च्छौपद्रुतक्षीवापब्रह्मोदृत्त फलयोनयः ॥

Suśruta Saṁhitā, I. xi.

³ शस्त्रानुशस्त्रेभ्यः चारः प्रधानतमच्छेद्यभेद्यलिख्य करणाविदोषप्रत्यादिशेषक्रियावचारणात् ।

Suśruta Saṁhitā, I. xi.

⁴ Ibid. Hoernle's Trans. Bibliothica Indica.

⁵ आख्याय च दव्यौकूच्चैश्लाकानामन्यतमेन चारं पातयेत् ।

Suśruta Saṁhitā, IV. vi.

2. *Śalākā* or rods,—plain probes are mentioned for application of caustic lotions to parts of the body. But generally the ends of the probes are shaped like spoon. To this class belongs the three spoon-like probes of Suśruta and the three nail-shaped probes of Vāgbhaṭa, described before¹.

3. *Kūrcea*,—it is a brush-like instrument.

The application of caustics has its advantages and disadvantages ; and these are to be considered in their relations to the pre-anæsthetic periods of surgery. Patients are still less terrified by their application than by surgical incisions. The real value of caustics is thus summed up by Velpeau.² “Nevertheless caustics possess some advantages which can not be denied them. As they do not give the idea of an operation, they shake less the minds of the patients, they are accepted with more calmness and with infinitely less effort, than the action of the knife. Mortifying the tissues step by step, they give rise to no effusion of blood, and affect less deeply the economy than the operation, properly so called. Women treated in this way do not require to remain in bed or to consider themselves as patients. The dressings require little care, and do not demand absolutely the intervention of the surgeon. The wound cleans itself very rapidly in general, and once cleaned, it proceeds speedily towards cicatrisation. Without exempting wholly erysipelas, phlebitis or purulent infection as some surgeons have asserted, there is notwithstanding, some reason for supposing that they expose the patient somewhat less to these troublesome complications than the operation”.

¹ See P. 158-159.

² Velpeau. Cancer of the breast. Marsden's trans.

25. AGNI. ACTUAL CAUTERY.

Suśruta says¹: “With regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not re-appear, and because it can cure diseases which are incurable by medicines instruments, and caustics.”² This partiality for cauteries is one of the reasons of the gradual decadence of Hindu surgery and its total extinction in the present time. To this belief of the Hindus may be compared the following aphorism of Hippocrates³:—

“Those diseases which medicine do not cure, the knife cures; those which iron can not cure, fire cures; and those which fire can not cure, are to be reckoned wholly incurable”.

For the application of the actual cautery the following articles are considered necessary⁴ :—

- | | |
|---|--|
| 1. Pippali or piper longum
2. Goat's dung
3. Teeth of a cow
4. Šara or saccharum sara
5. Probes or ſalākā (see before ⁵) | } These are to be used for diseases of the skin. |
|---|--|

¹ चारादग्निरौयान् क्रियासु व्याख्यातस्तद्ग्धानां रोगानामपुर्णभावाङ्गेषजशस्त्वन्नारेरसाध्यानां तत्साध्यलाभः ।

Suśruta Samhitā, I. xii.

² Ibid. Hoernle's Trans. Biblio. Ind.

³ The Works of Hippocrates. Syd. Soc., vol. II., p. 774.

⁴ अथेमानि दहनोपकरणानि । तद्यथा पिप्पल्यजाशक्क्लोदन्त शरश्लाका जाम्बवैष्टेर लोहाः चौद्रगुडस्तेहाश्च । तत्र पिप्पल्यजाशक्क्लोदन्त शरश्लाकास्त्वग्गतानां । जाम्बवैष्टेर लोहानि मांसगतानां चौद्रगुडस्तेहाः सिरस्नायु सम्यस्थिगतानां ।

Suśruta Samhitā, I. xii.

⁵ See P. 159-60.

6. Jāmvavauṣṭha ¹	}	Used for diseases of the muscles.
7. Different kinds of iron		
8. Honey ²		
9. Treacle		
10. Ghee		
11. Oil		

“Both Aetius and Oribasius represent goat’s dung, pounded with vinegar, as being equally efficacious as the sinapism, and applying particularly to rheumatic diseases.”³ Hippocrates says that cauterisation may be performed with boxwood spindles dipped in boiling oil.⁴ In Kordofan, are used “*El kamaia*. primitive instruments used for cauterisation consisting of a piece of camel’s or sheep’s dung dried and impaled on a long thorn.”⁵

12. Cautery knife.—This is to be used in the treatment of prolapse of the omentum in cases of abdominal injuries. The

¹ अश्वीं भगवन्दरग्यनिनाङ्गीदुष्टवणादिषु ।

मांसदाहो मधुसेह जाम्बवौष्ट गुडादिभिः ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxx.

² मधुच्छिष्ठेन तैलेन मञ्चचौद्रवसामृतैः ।

ततैर्वा विविधैर्लोहेर्दहेदाह विशेषवित् ॥

Caraka Saṃhitā, VI. xiii.

³ Adams’ Commentary on Paul. vol. iii. bk. vii. sec. xix.

⁴ Hippocrates, ii. 482.

⁵ Medical Practices in Kordonfan. Third Report. Wellcome Research Laboratory, Khartoum.

prolapsed part is to be ligatured well and the cautery knife used to remove the prolapse below the ligature¹.

Cautery knife was also known to the Greeks and Romans. Galen², speaking of cancer, says that “some use heated razor blades, at once cutting and burning”. Paul³ also mentions a sword shaped cautery in the radical cure of hydrocele.

13. Plates of copper, lead or iron.—In the application of both kinds of cauteries, plates of these metals are to be used to surround a tumour to prevent injury to the adjacent structures (Suśruta).⁴

Hippocrates⁵ in the treatment of nasal polypus, says that “when that occurs we must insert a tube and cauterise with three or four irons”. Celsus⁶ says that this tube may be a calamus or a tube of pottery.

14. Cakradatta mentions a probe of gold for applying actual cautery to the hair follicles after the removal of the eyelashes, to prevent a recurrence of trichiasis.⁷

Albucasis similarly recommends burning the roots of hairs

¹ उदरान्मेदसो वर्ति निंगता यस्य देहिनः ।

कषायभस्मस्तकौर्णा वज्ञा सूतेण सुवित् ।

अग्रितमेन शस्त्रेणच्छिन्द्यान्मधुसमायुतं ॥

Suśruta Saṃhitā, IV. ii.

² Galen, xiv. 786.

³ Paul, vi. lxii.

⁴ यदल्पमूलं वपुतामसीस पटे: समावेष्टा तदायसैर्वा ।

चाराग्निशस्ताण्य सक्षद्विदध्यात् प्राणानहिंसन् भिषग्प्रमत्तः ॥

Suśruta Saṃhitā, IV. xiii.

⁵ Hippocrates, ii. 244.

⁶ Celsus, vii. x.

⁷ See foot-note 2, p. 66.

in trichiasis with a probe of gold. Paul¹ applies a heated olivary probe or an aural probe for the same purpose. Haly Abbas and Rhazes also describe this operation.

26. BHEṢAJA OR MEDICINES.

This means such medicines as become necessary in the treatment of surgical diseases and do the work of surgical instruments to a certain extent. Suśruta gives a list of medicines,² required in the treatment of various kinds of inflammations, and I quote a few passages from the English translation³ to illustrate the action of medicines in surgical practice. "Warm poultices made of the following drugs promote suppuration, namely, fruits of *sana* (*Crotalaria juncea*), *Mūlaka* (*Raphanus sativus*), *Sigru* (*Moringa pterygosperma*), sesamum and mustard seeds, flour of barley and wheat, *kiṇya* (the drugs used as a ferment in distilling spirits) and linseed. The following medicines are applied for opening abscesses, namely, *chiravilva* (*Pongamia glabra*), *agnika* (*Semicarpus anacardium*), *chitraka* (*Plumbago Zeylanica*), *danti* (*Baliopernum montanum*), *hayamāraka* (*Nerium odoratum*), and the excrement of the pigeon, vulture and heron. Caustic alkalies are also very effectual in opening abscesses. Demulcent articles, such as, flour of barley, wheat or *másha* (pulse of *Phaseolus Rux.*) promote discharge from the interior of abscesses. * * * * Pastils for fumigating ulcers should be made of *śrīveshtatka* gum of (*Boswellia Thurifera*), *sarjarasa* (resin of *Shorea robusta*), *sarala* (*Pinus longifolia*), and *devadáru* (*Cedrus*

¹ Paul viii. xiii.

² See Suśruta Saṃhitā, I. xxxvi.

³ Dr. U. C. Dutt's Translation, Bibliotheca Indica, P. 151-154.

deodura); decoctions or cold infusions of astringent and unirritating barks should be used as washes for promoting granulations in ulcer. Tents for promoting granulations should be made of *soma* (*Sarcostemna brevistigma*), *amrita* (*Cocculus cordifolias*), *asvagandhá* (*Withania somnifera*), the plants included under the class of *kákolyádi*, and the buds of (*Ficus Bengalensis*)".

In treating inflammation, the Hindu surgeons used pastes to give relief to the pain and tension; warm poultices to promote suppuration; medicinal applications and incisions by knife for opening abscesses; demulcent articles to promote discharges; decoctions of drugs as corrective washes; tents of drugs and lint for introducing them into the cavities of the abscesses; decoctions in oils and clarified butter to improve the character of ulcers; pastils for fumigating sores; tents, pastes, powders and lotions for promoting granulations; drugs to repress high granulations; drainage to prevent infection, and bandages to give the part rest. This shows that the Hindus were not wholly ignorant of the antiseptic methods of treating wounds; and Suśruta enjoins that a certain incense should be kept burning in the operation room.

Of the additions to the list of Suśruta by Vāgbhāta, we need consider the goat's gut only.

GOAT'S GUT.

The intestines of the goats, etc. are to be dried and prepared as materials of ligature¹. They should be used in ligaturing fine vessels after incision by knife, evidently to check hæmorrhage.

¹ See foot note 1, P. 223.

The use of goat's gut in surgery is generally considered to have been unknown to the Greeks and Romans, as it is not mentioned in their works. But Adams points out¹ "that the strings of ancient harp were made of the guts of a sheep," and this he clearly proves from a passage in the *Odyssey* of Homer.

Hippocrates² used apolinose made of crude flax, which is also mentioned by Paul for the delegation of arteries. Rhases however describes the use of strings of harp³ as a material for suture in the operation called *gastroraphé*.

ARREST OF HÆMORRHAGE.

It is generally believed and often stated in modern works on surgery that the ancients were unacquainted with the proper treatment of hæmorrhage. Suśruta however enumerates four different ways of arresting hæmorrhage after venesection; namely:

1. Sandhāna :—Contraction of the wound by astringent decoctions of Chebulic Myrobalan and the root-barks of the panchavalkala trees (five barks).
2. Skandana :—or thickening of the blood by the application of severe cold.
3. Pāchana :—or descicating or drying up the wound by ashes.
4. Dahana :—or cauterising the veins to make them shrink⁴.

¹ See Commentary on Paul, VI. iii. vol. II, P. 345. Syd. Soc. Ed.

² Hippocrates, iii. 132.

³ Rhases. Cont. xxviii.

* चतुन्निधं यदेतद्वि रुधिरस्य निवारणं ।
सम्भानं स्कन्दनचैव पाचनं द्रहनं तथा ।

If the blood does not thicken by the application of cold, astringents should be applied; if these fail ashes should be used. By means of these three modes, the physician should endeavour to the best of his abilities to stop the bleeding, but if success be not still obtained, cautery may be resorted to as the absolute effective means¹. To stop bleeding from an artery, he advises us to apply astringents and pressure with the fingers. Vāgbhaṭa² also describes these methods of arresting haemorrhage, and advises us that if the ordinary means do not check the bleeding, the vessel must be again opened at a point in its course beyond the bleeding area, or actual cautery applied. Cakradatta also repeats these directions³.

Vāgbhaṭa however mentions the sheep's gut amongst the accessory instruments. His commentator explains its use for

ब्रणः कषायः सम्बते रक्तं स्कन्दयन्ते हिमं ।
तथा सम्पाचयेहस्थ दाहः सहोचयेत् सिराः ॥

Suśruta Saṁhitā, I. xiv.

¹ अखदमाने रुदिरे सम्बानाति प्रशीजयेत् ।
सम्बाने भृशमाने तु पाचनैः समुपचारेत् ॥
कल्पेरतैस्त्रिभिर्वेद्यः प्रयतेत् यथाविधिः ।
असिद्धिमत्सु चैतेषु दाहः परम् इष्यते ॥

Ibid.

² रक्ते लविष्ठति चिप्रं सम्भन्नौमाचरेत् क्रियान् ।
नौभ्र प्रियङ्गु पत्तङ्ग माषयव्याह गोरिकैः ॥
सूतकपालाञ्जनचौम षष्ठी चौरीलगङ्गुरेः ।
विचूर्णयेद् व्रणसुखं पद्मकादि हिमं पिवेत् ॥
तामेव वा शिरां विष्वेद्याधात् तमादनन्तरं ।
शिरासुखं वा लवितं दहेत् तपश्चलाक्या ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

³ See Cakradatta, Śirāvyanḍhādhikāra.

ligaturing blood-vessels¹. Suśruta says that if in venesection, or in treating wounds, excessive bleeding occurs, it should be stopped by proper means².

Celsus³ advises us to fill up the wound with dry pledgets, then to apply a sponge squeezed out of cold water and to press with the hand. If not successful, cut the vessel asunder between two ligatures, or apply cautery, or try the method of revulsion. Galen⁴ applies pressure by finger on the wounded vessel, or twists it moderately. If the vessel be an artery, he gives the alternative of a ligature or cutting across. Paul⁵ mentions all the methods to stop the bleeding, *viz.*, pressure, styptics, ligature, escharstics, and cauteries with fire.

Albucasis⁶ mentions four methods of stopping the discharge of blood from an artery :

1. By cautery.
2. By dividing the artery across.
3. By using the ligature.
4. By styptics and bandage.

Avicenna⁷, Rhases⁸ and others also mention these methods

¹ अत्वं मेषादीनां शुक्रान्वं तां इत्यातं शस्त्रक्षेदानन्तरं सूज्जसिरादिवस्त्रनादिषु युज्यते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

² तैलेन्नित्तैवं हृधा शोनिते प्रसुते भृशं ।

कार्यं यथोत्तवैदेन शोनितस्थापनं भवेत् ॥

Suśruta Saṁhitā, IV. i.

³ Celsus, v. 26.

⁴ Galen. Meth. Med. v.

⁵ Paulus Aegineta, IV. lii. vol. II. P. 127. Syd. Soc. Ed.

⁶ Albucasis. Chirrug. i. 58.

⁷ Avicennæ Cantic. ii. 2., and Collig. vii. 23.

⁸ Rhases. Divis i. 39; Contin. xxviii.

for arresting hæmorrhage. Thus it becomes apparent that the use of ligature for stopping bleeding was well known to the ancient surgeons and the present methods of arresting bleeding are only the revival of the old practice. Adams¹ concludes: "It appears, therefore, that the use of the ligature for stopping hemorrhages was well understood by the ancients, and had never been lost sight of even in the darkest ages."

¹ Adam's Commentary on Paul, vol. II. p. 132.

CHAPTER VI.

THE ŚASTRA OR THE SHARP INSTRUMENTS.

1. THE MĀNDALĀGRA OR ROUND HEADED KNIFE.

It is described as a round or circular headed cutting instrument, having a length of six aṅguli. Two sub-varieties are noted —one with a circular edge and the other shaped like a razor (Dallaṇa).¹ Vāgbhaṭa², however, describes the blade to be shaped like the index finger when its nail points towards the palm of the hand. This would then resemble the decapitating hook of Ramsbotham.

It is said to have been principally used for the operation of cutting through and scraping³; so it is recommended to be used

¹ मण्डलमिवाय' यस्य सत् मण्डलाय' तच्च द्विविधम् तथाहि—

यदगे मण्डलं बृत्' चुरं संस्थानमेव वा।

मण्डलायस्य जानीयात् प्रमाणन्तु घडङ्गुलम्।

Nivandha Saṅgraha, viii.

² मण्डलाय' फले तेषां तर्जन्यन्तर्खाकृतिः।

लेखने क्षेदने योज्यं पोथिकी शुग्णिकरदिषु॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

मण्डलायं, मण्डलायं नाम शस्त्रं, फले, फल प्रदेशे, तर्जन्यन्तर्खाकृति स्यात्, अन्तः, अन्तर्हितो नखः, अन्तर्खः, तर्जन्या अन्तर्खः; तर्जन्यन्तर्खः, तर्जन्यन्तर्खः, तस्येवाकृतिः राकारी यस्य तत् तर्जन्यन्तर्खाकृतिः। तच्च पोथिकी गलशुग्णिकारदिषु, लेखने, लेखनं कर्मणि, तथा क्षेदने, क्षेदनं कर्मणि, योज्यं।

Vāgbhaṭārtha Kaumudī, I. xxvi.

फलोद्देशे तर्जन्या अन्तर्खस्तर्जन्यन्तर्खस्यैवाकृतिर्यस्य तदेवम्।

Sarvāṅga Sundari, I. xxvi.

³ तत्र मण्डलायकरपवे स्यातां क्षेदने लेखने च।

Sūrūpa Saṁhitā, I. viii.

in the operative treatment of enlarged tonsil¹. It is also advised to be used for piercing the skull of a dead foetus in utero to help its easy extraction by other instruments. So any other presenting part causing difficulty in the delivery of the dead foetus, is to be cut with it. It is claimed that there is less likelihood of damaging the soft parts of the mother by this instrument than by the sharp pointed vriddhipatra.²

We find that Suśruta recommends a maṇḍalāgra knife in ophthalmic practice for scraping away the membranous expansion in the operation of pterygium³ and other ophthalmic operations,

¹ अङ्गुष्ठाङ्गुलिसन्दशेनाकृष्ट गलयुग्धिकां ।

क्षेदयेन्मण्डलाग्रेण जिह्वोपरि तु संस्थिताम् ।

नोत्कृष्टच्चेव हीनच्च विभागं क्षेदयेन्निष्पक् ॥

Suśruta Saṁhitā, IV. xxii.

² तत्र स्त्रियमाशास्त्र मण्डलाग्रेणाङ्गुली शस्त्रेण वा शिरो विदार्थं शिरःकपालान्ताहत्य शङ्खना गटहीलोरसि कचायां व्यपहरेदभिन्नेशिरसि चाचिकूटे गणे वा अंससंसक्तस्थांसदेशे वाङुं क्षिला दृतिमिवाततं वातपूर्णोदरं वा विदार्थं निरस्यान्ताणि शिधिलीभूत माहरेज्जघनसक्तस्थ वा जघनकपालानीति ।

यद, यदङ्गं हि गर्भस्त्र तस्त्र स्वजति तद्विषक् ।

सम्यविविन्द्वरेच्छिला रचेन्नारौच्च यद्रतः ।

गर्भस्त्र गतयश्चिवा जायन्तेऽनिलकोपतः ।

तत्रानाल्यमतिब्बेदो वर्त्तेत विधिपूर्वकं ॥

नोपेच्चेत मृतं गर्भं मूहुर्तं मपि पर्णितः ।

सह्याशु जनर्णो हन्ति निश्चासं पशुं यथा ॥

मण्डलाग्रेण कर्त्तव्यं क्षेयमन्तर्विजानता ।

बृद्धिप्रदं हि तीचाय नारीं हिंस्यात् कदाचन ।

Ibid, IV. xv.

³ अर्म्म यत्र वलीजातं तवैतद्विग्रहेद भिषक् ॥

अपाङ्गं प्रेत्तमाणस्य वडिशेन समाहितः ।

मुचुण्डग्राग्न्यं मेधावी सूचीसूतेण वा पुनः ॥

नचोत्त्वापयता चिप्रं कार्यमभ्युत्रतं तु तत् ।

such as for vascular net-work and nodules on the eyeball¹. Cakradatta says² that if the pterygium extends to the black part of the eye, the membrane is to be raised by the point of a needle, transfixed by a vadīśa or hook, and leaving the pupil free, is to be excised, as Sivadāsa³ explains, by the mandalāgra. He also uses it to scrape away the root of any new growth in the eye⁴ and to perform the operation of scratching in ophthalmic surgery⁵.

शस्त्रपातभयाच्चासर वत्तम नी ग्राहयेद् दृढ़ं ॥
 ततः प्रशियिलौभूतं विभिरेव विलम्बितं ।
 उज्जिखन्मण्डलाग्रेणः तौक्षणे न परिशोधयेत् ॥
 विमुक्तं सर्वतश्चापि क्षणाच्छुक्षाच्च मण्डलात् ।
 नौत्वा कनीनकोपानं क्षिन्यान्नाति कनीनकं ॥
 चतुर्भागस्थिते मांसे नाच्चि व्यपत्तिमहंति ।

Suśruta Samhitā, VI. xv.

¹ सिराजाले सिरायास्तु कठिनास्ताश्च बुद्धिमान् ।
 उज्जिखेन्मण्डलाग्रेण वडिशेनावलम्बितः ॥
 सिरासु पिङ्काजाता या न सिध्यन्ति भेषजैः ।
 अर्घवन्मण्डलाग्रेण तासाञ्छेदनमिष्यते ॥

Ibid.

² अर्घ्यं तु छेदनौयं स्वात् क्षणप्राप्तं भवेद्यदा ।
 वडिशविद्वसुन्नत्य विभागच्चाव वर्जयेत् ॥

Cakradatta, Netraroga Cikitsā.

³ अर्घ्यक्षेदनौयमिति मण्डलाग्रेणेति शेषः । समुद्रमेति सूच्यग्रेणेति शेषः । सूच्यग्रेण समुद्रम्य उत्तोत्य अनन्तरं वडिशेन विद्वा मण्डलाग्रेण क्षेदयिदित्यर्थः ।

Tattva Candrikā, Netraroga Cikitsā.

⁴ अर्घस्तथावर्त्मनामा शुष्काशीऽर्घ्यदमेव च ।
 मण्डलाग्रेण तौक्षणे ण मूलिच्छिन्द्याद भिषक् शनैः ॥

Cakradatta, Netraroga Cikitsā.

⁵ भित्तोपनाहं कफजं पिपलौ मधुसैन्धवैः ।
 विलिखेन्मण्डलाग्रेण प्रक्षयेद्वा समन्ततः ॥

* * * *

A small instrument with a broad blade and a rounded cutting tip is figured by Albucasis¹ in connection with ophthalmic work. This was the scalpel for the plastic operation on the eyelid as for trichiasis. Incisions were made by this knife on the eyelids in such a way as to enclose a leaf-shaped area which was then dissected off. The lips of the incisions were then united with three or four sutures². Paul³, quoting Aetius⁴, describes the operation for pterygia :—“ Having separated the eyelids, and seized upon the pterygia with a hook-like instrument, having a small curvature, we stretch it, and taking a needle having a horse-hair and a strong flaxen thread in its ear (eye ?), and a little bent at the extremity, we transfix it through the middle of the pterygium, and with the thread we bind the pterygium and raise it upwards, while with the hair we separate and saw as it were the part at the pupil away unto its extremity ; but the remainder of it at the great canthus we cut off from the base with the scalpel used for the operation by suture, but leaving the natural flesh of the canthus, lest there be a running of the eye when it is taken away. Some stretching as aforesaid with a thread, dissect away the whole pterygium with the instrument called pterygotomos, taking care not to touch the corner.”

Cakradatta mentions the use of the mandalāgra for scarifying

मृतसैन्धवं चूर्णं कफानाहं पुनः पुनः ।

विलिखिन्मण्डलाग्रेण प्रच्छयेदा समन्वतः ॥

Cakradatta, Netraroga Cikitsā.

¹ Milne. Graeco-Roman Surgical Instruments, Pl. ix. fig. 3.

² Paulus Aegineta, VI. viii.

³ Ibid, VI. xviii.

⁴ Aetius, II. iii. 60.

the tongue for bleeding in the disease called *jihvākantaka* (prickly tongue)¹. He also uses it in *adhijihvā* or ranula and says: "The tongue is to be raised, the ranula is to be drawn up and fixed by a sharp hook, and then excised by the *māndalāgra*. Afterwards a strong gargle is to be prescribed".² Pālakāpya³ also describes it to have a length of nine *aṅguli*, the handle being six, and the blade three *aṅguli* long. The end is full-moon-shaped and it is directed to be used for scarification on the eyeball.

It seems that *māndalāgra* of different sizes and shapes were used. For the instrument used for perforating the foetal cranium in uterus would scarcely be thought fit for a delicate operation on the eyeball.

Soranus⁴ mentions a special instrument for perforating the foetal head. Rhases⁵ directs us to open the head when the child's cranium is large and cannot be brought down. Haly

¹ कण्ठकेषु कफोत्येषु लिखितेष्वस्त्रजः चये ।

पिपल्यादिर्घुयुतः कार्यन्तु प्रतिसारणम् ॥

Cakradatta, *Jihvāroga Cikitsā*.

लिखितेष्विति मण्डलाग्रादिना ।

Tattva Candrikā, Ibid.

² उद्भास्य जिह्वामाकृष्ट वडिशेनाधिजिह्विकाम् ।

क्षेदयेन्वरण्डलाग्रेण तौद्योच्यैर्लवणादिभिः ॥

Cakradatta, *Mukharoga Cikitsā*.

³ लेखनं मण्डलाप्रेण कर्त्तव्यं दन्तिनां भवेत् ।

Pālakāpya, III. i.

पूर्णचन्द्राकृत्याग्रमण्डलाग्रम् लेखनार्थमक्षणो ।

Pālakāpya, III. iii.

⁴ Soranus, II. viii., P. 366.

⁵ Rhases, Cont. xxii.

Abbas¹ also advises us to open the head when it is preternaturally large. Aetius² also gives a similar discription. Some authors recommend the polypus-sealpel or the phlebotome in embryotomy. The embryotome figured by Albucasis³ is a straight two-edged blade, and we may conjecture that the mandalāgra used by the Hindus for perforating the foetal cranium was a similar instrument.

2. KARAPATRA OR SAW.

It literally means, "an instrument having the blade in the form of a hand", the fingers being represented by the teeth of the saw. Others explain, as Dallana⁴ points out, the name from its resemblance to a carpenter's saw. It seems that saws of various sizes were used. Suśruta mentions its length to be six aṅguli, Vāgbhaṭa⁵ describes it to be ten aṅguli

¹ Haly Abbas, Pract. ix. 57.

² Aetius, XVI. 23.

³ Graeco-Roman Surgical Instruments, Pl. viii. fig. 7.

‘करपवनिति करवत् पव’ करपव’ यथा करोऽङ्गुलिभिराचितो भवति तदृत् यत् कण्ठके-राचितं स्वात्त् करपवमूच्यते। अन्ये तु करपवशस्वं करपवाकारमेव तत्र द्वादशाङ्गुलं तन्नान्तर वचनात्। ननु यदि तन्नान्तराचाच्च द्वादशाङ्गुलं करपवमूच्यते तर्हि स्वतन्त्रे विरोधः क्लातः स्वतन्त्रे करपवस्य निर्दिष्टप्रभाणत्वात् शेषानि तु षडङ्गुलानि इत्यनेन वाक्येन षडङ्गुलमेव करपवम् स्वात्र द्वादशाङ्गुलं नैवम् तिषाम् नामाभिरेवाकृतयः प्रायेण व्याखाता इत्यस्यात् स्वतात् प्रायः शब्दोऽनुवर्त्ततेतेनायमर्थं, शेषानि प्रायेण षडङ्गुलानि एवं शस्त्रमानेऽन्यचार्यविरोधः।

Nivandha Saṃgraha, I. viii.

⁵ क्लेदेऽस्यां करपवन्तु खरधारं दशाङ्गुलं।

विस्तारे द्वाङ्गुलं सूच्छदनं स्वत्सरु वन्धनं॥

Aṣṭāṅgā Hṛdaya Saṃhitā, I. xxvi.

करपवाग्यां शास्त्रमाह क्लेदे इत्यादि करवत् पव यसा तत् करपवं, अङ्गुलिभिराचितो यथाकारो भवति तदृत् यत् कण्ठकेराचित् तत् करपवमूच्यते। करपवं करगत् गत्यात्। करपवं खरधारं, खरा, तौक्ष्या, धारा यसा तत्थाविधम्, तथा दशाङ्गुलम्,

long and two aṅguli broad ; while Bhoja¹ alludes to a saw, twelve aṅguli long. The edge of the instrument is described as rough and serrated ; and this is the only instrument that need not have a very sharp edge.

The handle of the saw should be well formed and pegged. Its principal use is to saw a bone. Sometime it is recommended for the purpose of scraping.

Saw is frequently mentioned by the Greek and Roman authors in the descriptions of operations on the bones. Celsus² mentions it in describing the amputation of a gangrenous limb. With reference to fractures of the bones of the head, Paul says³: “But the mode of operating with saws and the instrument called choenicides or modioli (trepans ?) is condemned by the moderns as a bad one.” Evidently he means flat cranial saws. Galen⁴ also mentions the “knife-shaped saws.”

In modern times the saw is still used for identical purposes in surgery.

There is no mention of trephine in Hindu surgery though Jīvaka (500 B.C.) is said to have practised cranial surgery with success⁵. Pandit Vallala describes⁶, in his Bhojaprabandha or

दैर्घ्येन दग्धाङ्गुलं परिमाणं, तथा विस्तारे दग्धुलं, परिसरे अङ्गुलदयपरिमितं तथा सूक्ष्मदन्तं मध्मा दन्ताकारा दन्त यस्य तत्त्वाविधं, तथा खत्सरवम्बनं, तस्रु खड़्गादि मुष्टिः वम्बनं, कौलादिना वम्बनं, त्रस्रश्च वम्बनञ्च ते तस्रु वम्बने, शोभने त्रस्रु वम्बने यस्य तत्त्वाविधं । तच्च अस्थ्यां क्षेदि, क्षेदन कर्मनि योज्यं ।

Vāgbhaṭṭārtha Kaumudī, I. xxvi.

¹ See foot-note 4, P. 230.

² Celsus, VII. xxxiii.

³ Paul, VI. xc.

⁴ Galen, XVIII. 331.

⁵ See Mahāvāgga, VIII. 1.18. Sacred Books of the East. Vol. xvii.

⁶ See foot-note 1, p. 60.

Anecdotes of King Bhoja, a surgical operation performed on the king. He was suffering from a severe pain in the head. Medicines did him no good, and so to give relief, surgical interference was thought necessary by two brother surgeons who happened to arrive in Dhar at that time. They are said to have administered a drug called sammohinī to render him insensible. They then trepanned the skull and removed the real cause of his complaint. They closed the opening, stitched the wound and applied a healing balm. They are then said to have administered to the king another drug called sañjibani to accelerate the return of consciousness.

Trephine was well known to the ancient Greeks and Romans. Hippocrates¹ mentions a trephine or a saw having a circular motion, in the treatment of injuries to the head. Paul also mentions trephine, the use of which is, he says, condemned by the moderns. Sprengel² remarks, that “Galen was averse to the use of the trepan, though he performed the operation on the head occasionally.”³

3. VRDDHIPATRA.

This sharp cutting instrument is called vrddhipatra from its resemblance to the leaf of a medicinal plant called vrddhi. Two varieties of this knife are described by Vāgbhāta⁴—one is

¹ Hippocrates, III, 371, 374.

² Hist. de la Méd., 18.

³ Adam's Commentary on Paul, VI, xc. Vol. ii., p. 436.

⁴ वृद्धिपत्रं चुराकारं क्षेद मेदन पाटने ।

कृञ्जग्रस्तुष्टते शोफ गम्भीरे तु तदन्यथा ।

नतायं पृष्ठतो दीर्घं ऋसवक्त्रं यथायथं ॥

straight throughout and it is to be used for opening pointed superficial abscesses; and the other has the end bent or curved. Again amongst the second class of curved knives, some have their ends long and therefore called dīrgha-vaktra or long-mouthed, and these are to be used for opening the deep seated abscesses, while others have their ends short and therefore called hrasva-vaktra or short-mouthed, and these are to be used for superficial abscesses that would not point. Suśruta describes them to be six aṅguli long. Dallāṇa in his commentary¹ says:— Both the varieties, one with a curved,—and this is called a kṣura or razor,—and the other with a resected point, should be seven aṅguli long; the haudles and the blades should measure five and a half and one and a half aṅguli respectively.” These are to be used for cutting through a part, partially or completely, and also for puncturing it.

हृद्धिपवाल्यां शस्त्रमाह हृद्धिपवमित्यादि हृद्धिपवं नाम शस्त्रं, चुराकारं, चुराक्षति, चुरय लोमच्छेदकः शस्त्रविशेषे नरगुन्दराणां। तत्र हृद्धिनामौषधं हृत्स्य पवसट्टश फलकवात् हृद्धिपवाल्यं लभने। तदृ हृद्धिपवं नाम शस्त्रं द्विदे भेदने पाठने च कर्मणि योज्यमिति कृञ्जयमित्यादिना विषय विशेषे हृद्धि पवस्याकार भेद उच्चते। यत् हृद्धिपवं कृञ्जयं सरलाग्नभागं, आग्रतायमित्यर्थः। तत्, उप्नने, उक्तिते, शोके, शोथे, योज्यं। गधीरे, भेद आदि धातुश्च शोफे, तथा तदन्यया, अनुनन्ते च शोफे, यत् प्रष्ठतः, पृष्ठदेशे नताय वक्रीभूतायभागं, कुचितायमित्यर्थः। तत् हृद्धिपवं शस्त्रं यथायथं दीर्घं झस्त्र वक्रं, दीर्घं सुखं, झस्त्र मुखं वा योज्यं। यथायथमिति गधीरे शोके दीर्घवक्रं, अनुनन्ते च शोके झस्त्रवक्रमित्यर्थः। अत द्विविधं हृद्धिपव शस्त्रयुक्तम्, इति अपि सताङ्गुलं प्रमाणे, हयोरपि अईपञ्चाङ्गुलं हृत्स्य कार्यं साईङ्गुलदयं फलमिति। भेदनः, भेदं, एकमिन् शारीरदेशे शस्त्रमावगात्य अपर दिशा शस्त्रायम् निष्काशनं भेदनं। पाठनं, विद्वारणं फाइन इति लोके।

Vāgbhātartha Kaumudī, I. xxvi.

¹ हृद्धिपवमिति, हृद्धे: पत्रमित्र हृद्धिपवं तत्र द्विविधं एकं अच्चितायं, हितौयं प्रयतायं, हे अपि सताङ्गुलं प्रमाणे हयोरपि अई पञ्चाङ्गुलं हृत्स्य कार्यं साईङ्गुलम् फलम् इति अनयोर्मध्ये अच्चितायं हृद्धिपवं चुरमाहुः।

Nivandha Samgraha, I. viii.

One form of the vriddhipatra resembles in shape the razor used by the barbers,—not the English razor that has now become common in Bengal, but the country-made razors which are still used by the barbers in the North-West Provinces.

Suśruta recommends the use of razor, scissars and pinehers for shaving the parts before operation; for “the hairs”, he says, “prevent the healing up of the wound rapidly”¹. He again uses vriddhipatra as a knife and observes:—“If bitten by spiders whose bites are amenable to treatment, the area of the wound should at once be excised out by the vīddhipatra, and then actual cautery applied by the red-hot jāmvavauṣṭha probe till the patient requests for its withdrawal”².

Suśruta uses the vriddhipatra knife for the removal of the serotal tumour and says³: “The serotal tumour is to be well fomented and bandaged. The patient should then be cheered up, and leaving the testicles intact, underneath the median raphe, the tumour should be excised by vriddhipatra knife. The fatty tissues being

¹ रोमाकीर्णे ब्रणो यस्तु न सम्यगुपरीडति ।

चुरक्षरौमन्दश्चै स्तस्परोमाणि निर्वरेत् ॥

Suśruta Saṃhitā, IV. i.

² साध्याभिराभिनुताभिर्दद्मातस्य देहिनः ।

बङ्गिपवेण मतिनान् सम्यगादंशमुडरेत् ॥

जाम्बुषेनाग्नि तपेन दहेदाकर वारणात् ।

Ibid, V. viii.

³ सिन्नां चावेष्ट्र पट्टेन समाश्वासयतु मानवं ।

रक्षेत् फले सेवनीच्च बङ्गिपवेण दारयेत् ॥

मेदस्तः ससुडृत्य दद्यात् कासीससैवते ।

वज्ञीयाच्च यथोद्दिष्टं ।

Ibid, IV. ix

removed, powdered ferri sulphur and rock salt are to be dusted over the wound and proper bandages applied.”

Vṛddhipatra was also used by the ancient veterinary surgeons. Joyadatta Suri writes¹: “The knife known as vṛddhipatra is shaped like a kṣura or razor. It is three aṅguli long and should be used by the wise to incise a suppurated abscess”. In Pālakāpya², we find that “it is ten aṅguli long; the handle being six aṅguli and the blade four aṅguli long and three aṅguli broad. It is used for scission and excision”. He uses it also in opening a sinus after well ascertaining its course by means of a probe³.

Hypodermic medication:—The use of hypodermic syringe was not known to the Hindus. They were acquainted however with the hypodermic method of exhibition of drugs. Śāringadhara⁴

¹ वृद्धुं छिपन्न चूराकारं प्रकीर्तिम् ।
पक्षशोथादिषु प्राज्ञः पाटनं तेन कारयेत् ॥

Aśvavaidyaka, XIV. v. 22.

² शस्त्रे ण छिपते ण वाऽसि(ग्य)तेन सि(ग्य)तेन वा ।
शस्त्रकर्मणि निष्पातः सुपक्तं पाठ्यहिष्पकं ॥

Pālakāpya, III. iv.

छिपते ण नागानां कुर्याच्छेदनं भेदने ।

Pālakāpya, III. i.

³ अथ भिषगयन्वाधायोक्तेन विधिना सुयन्तिं वारणमभिविशासाऽश्व(ग्य)व्य स्तम्भानुगतं गतिमनं स्वत्यमुखं नाडीत्रणमेषण्या च विशिला छिपते ण शस्त्रेणानुलोमं पूयप्रतिररणार्थच्छेदं कुर्यात् ॥

Pālakāpya, III. xv.

⁴ प्रजयि वा चुरेणाङ्गं केवलानिलपौडितम् ।
तव प्रदेहं दद्यात्र पिटं गुञ्जाफलैः कृतम् ॥
तेनावताहजा पौडा विपची गृहसी तथा ।
अन्यापि वातज्ञापौडा प्रगमं याति विगतः ॥

Śāringadhara Saṅgraha, III. xi.

directs us to scarify a part with a razor and then apply an ointment of *guñjā* (*Abrus precatorius*) in sciatico, serofulous glands of the neck, etc. For treating a person in the state of unconsciousness caused by the derangement of all the humours, he directs us to scarify the anterior fontanelle with a razor, then to apply as much medicine as can be carried on the point of a needle to the part and rub it with fingers¹. The medicine is to be prepared thus:—take aconite 1 pala, quicksilver 1 śāna; mix, and put inside two sorābas or earthen basins smeared with powdered glass and placed face to face. Apply some external application over this and put it on fire for six hours. Then open the basins, take the soot collected on the upper basin and deposit it in a glass vessel quickly to prevent exposure. Caraka² also advises us to apply a medicinal paste on a cranial incision, shaped like

¹ विषं पलभितं सूतः शाणिकश्वर्णयेद्यम् ।
तच्चुर्णं सम्पृष्टे च क्रत्वा काञ्जितसरावयोः ॥
सुद्रां दत्त्वा च संशोष्य ततश्चल्लग्रां निवेशयेत् ।
वर्णं शनैः शनैः कुर्यात् प्रहरद्य संख्यया ॥
तत उत्पाद्य तस्मुदामुपरिण्ये सरावके ।
संलग्नो यो भवेऽज्ज्ञः तं गट्ठीयाच्छनैः शनैः ॥
वायुस्पर्शी यथा नगरात् ततः कुप्यां निवेशयेत् ।
रसः मूचीमुखेलग्रन्थ्या निर्याति भेषजम् ॥
तावन्मात्रो रसो देयो मूर्च्छिने सन्निपातिनि ।
चुरेण प्रक्षिने मूर्च्छि तदहुल्या च घर्षयेत् ॥
रक्त भेषज सम्पर्कान्मुर्च्छितोऽपि हि जीवति ।
तथैव सर्पदंष्ट्रम् स्तावस्थोऽपि जीवति ।
यदातापो भवेत् तस्म मधुरं तत दीयते ॥

Sāringadhara Saṅgraha, II. xii.

² विषदूषित कफमार्दः सोतसंरोधरुद्वायुश ।
मृतद्व श्वसेन्मर्त्यः मगादसाध्यलिङ्गेदिहीनश ॥

the foot of a crow, in case of snake-bite when he becomes unconscious but his life is not completely despaired of.

4. NAKHA ŚAstra OR NAIL PARER.

Suśruta¹ mentions its length to be eight aṅguli. Dallāṇa² says that its blade is two aṅguli long and one aṅguli broad. Vāgbhaṭa³, on the other hand, describes the length to be nine aṅguli. Arunadatta⁴ thinks it to be a double instrument, one end having a straight edge and the other an oblique one. Some explain⁵ that two different kinds of nakha śastra—one with a straight and the other with an oblique edge—are directed to be used.

चर्मकषायाः कल्पं विक्षसमं मूर्दिं काकपदमस्त्रा ।

कल्पा कुर्यात् कटभौं कटुकोटफला प्रधमनन्त्र ॥

Caraka Saṃhitā, VI. xxv.

¹ तव नखश्लैघण्यावटाङ्गुले सूच्योवत्यन्ते ।

Suśruta Saṃhitā, I. viii.

² नखशस्त्रमिति नखानां क्षेदनाय शस्त्रं नखशस्त्रं तस्य फलं द्वाङ्गुलायामम् एकाङ्गुलं विसृतम् ।

Nivandha Saṃgraha, I. viii.

³ वक्रजुंधारं दिगुरुं नखशस्त्रं नवाङ्गुलं ।

सूच्याशल्योऽनुतिच्छे देवं प्रक्षान लेखने ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

⁴ नखशस्त्रं नखच्छेदकं प्रसिद्धं । तच्च वक्रा क्षजूथधारा यस्य तदेवम् । तस्येकं सुखं वक्रमन्तर्देजं स्पष्टम् ।

Sarvāṅgasundarī, I. xxvi.

⁵ नखशस्त्रमाह वक्रजुंधारमिथादि नखानां क्षेदनाय शस्त्रं नखशस्त्रं तत् हिसुखं हि दिः प्रकारं सुखं यस्य तद्विसुखं तथा वक्रजुंधारं एकं वक्रं धारं अपरम् क्षजूधारं सग्रात्, तथा नवाङ्गुलं उभयोमपि देव्येण नवाङ्गुलयरिमितं तच्च नखशस्त्रं शल्योऽनुत्यादी योज्यं शल्यानां कण्ठकदीनामुडृति रुद्रणं शल्योऽनुतिः प्रक्षानं चेरा इति यस्य प्रसिद्धिः लेखनं चांचन् इति लोके ।

Vāgbhaṭārtha Kāṇḍī, I. xxvi.

They are principally recommended for cutting, puncturing and scarifying¹; and also for the extraction of needles and minute foreign bodies from the soft parts.

There is no mention of a many-bladed scarifieator in the surgical books of the Hindus, but its office was performed by the nakha śastra, in wet cupping, by making parallel incisions close to one another.

Paul² alludes to an instrument compounded of three blades joined in such a way that at one stroke, three scarifications were made; but he prefers a single scalpel for the purpose.

Pālakāpya mentions an instrument called rampaka³, having the handle ten aṅguli and the blade three aṅguli long. It is to be used for paring the nails and cleaning the feet of the elephants.

5. MUDRIKĀ.

It is described to be a cutting instrument of the size of the last phalanx of the index finger⁴; it is also called aṅguli-śastra or finger-knife. Vāgbhāṭa describes this instrument but not clearly. He says that the mouth of the aṅguli-śastra looks as if coming out of a ring, and the blade is half an aṅguli wide. A ring, having the size sufficient to admit the terminal phalanx of the index

¹ वृद्धिपत्र नखशस्त्र सुद्रिकोपलपञ्चकाहं धारानि क्षेदने भेदने ।

Suśruta Saṃhitā, I. viii.

² Paulus Aegineta, VI. xl.

³ रम्पकस्ताङ्गुलसुखो दशाङ्गुलवत् पादशोधनार्थं नखक्षेदनार्थं चेति ।

Pālakāpya, III, xxx.

⁴ प्रदेशिन्ययपर्वप्रदेशप्रमाणासुद्रिका ।

Suśruta Saṃhitā, I. viii.

finger, should be soldered to it. The base of the instrument has a thread tied to it¹.

It is recommended to be used for cutting through neoplasms in the throat. In its uses, Vāgbhaṭa says that it resembles the maṇḍalāgra and vṛddhipattra; and so was sometimes required for perforating the skull of a dead foetus in the uterus of its mother².

Dr. Simpson of St. Andrews (1744) is said to have invented an instrument, a “ring scalpel” for opening the skull. It consists of a loop of steel, through which the finger is to be passed

¹ कुर्यादङ्गुलिशस्वकं ।
सुद्रिकानिर्गतमुखं फलेत्वाङ्गुलायतं ।
योगतो वृद्धिपवेण मण्डलाग्रे ण वा ससं ।
तत्प्रदेशिन्यग पर्वप्रमाणार्पणं सुद्रिकम् ।
सूचवद्वं गलस्तोतो रोगद्वेदनं भेदने ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

कुर्यदित्यादिना अङ्गुलिशस्वकं व्यक्ति । सुद्रिका अङ्गुरीयकिण निर्गतं निष्क्रान्तं सुखं यस्य तत्तथाविधं सुद्रिकानिर्गतमुखं तथा फले फलोद्देशे अर्डाङ्गुलायतं अर्डङ्गुअमाच्र विस्तार अङ्गुलि शस्त्रकं अङ्गुलिनाम शस्त्रं कुर्यात् । तच्च योगतः प्रयोगे वृद्धिपवेण मण्डलाग्रेण वा समतुल्यं भवति । लेखने च्छेदने वृद्धिपवत् योज्यं किञ्च्चा क्षेदनं भेदनं पाटने मण्डलाग्रवत् योज्यमित्यर्थः । तदित्यादि तदङ्गुलि शस्त्रकं प्रदेशिन्यग पर्वप्रमाणार्पणं सुद्रिकं कुर्यादिति योज्यं । बैद्यस्य प्रदेशिनी नाम्नौ अङ्गुलि स्तस्या अयं यद् पर्व तत्तथा तस्य यत् प्रमाणं परिमाणं तदर्पणा तत् प्रवेशोपयुक्ता सुद्रिका यस्य तत्तथाविधं । सुद्रिका सुदर्ही आडटी इति वा स्वाता । तथा सूचवद्वं मूलदेशे सूचेणवद्वं तच्च गलस्तोतो गतानां रोगाणां द्वेदने भेदने च योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

² विष्कम्भौ नाम तौ मूढौ शस्त्रदारणमहंतः ।

मण्डलाङ्गुलि शस्त्राभ्यां तत्त्वकर्म प्रशस्तते ।

वृद्धिपवं हि तीक्ष्णायं न योनादवचारयेत् ॥

Aṣṭāṅga Hṛdaya Saṃhitā, II. ii.

and from which protrudes a sharp pointed blade about an inch long, by which the cranium was piered¹.

In the pseudo-Hippocratic treatise² a knife to fix on the thumb and dismember a foetus in utero is mentioned. This knife is called by Turtullian³ the “ring knife”, whereby the limbs are advised to be cut off in the womb. It is interesting to point out that mudrikā also means a ring.

The veterinary surgeons still use a scalpel blade mounted on a ring⁴, through which a forefinger is passed to dismember foals and calves in exactly the same way.

6. UTPALAPATRA.

This knife is described to have the shape of a petal of the blue lotus. The end is long, sharp and pointed. The utpalapatra is dīrgha-vaktra or long bladed, while the arddhadhāra is the hrasva-vaktra or short bladed knife⁵. It is to be used for cutting through and puncturing the parts.

¹ Ed. Med. Essays, vol. V, Part I, P. 445.

² Hippocrates, I. 463.

³ De Anima, 26.

⁴ Graeco-Roman Surgical Instruments, Pl. vii. fig. 1.

५ दीर्घं कङ्गवक्त्रं यथायथं ।

उत्पलाध्वं धाराख्ये भेदने द्वैदने तथा ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

उत्पलपवाख्यध्वं धाराख्ये शस्त्रे आह उत्पलेत्यादि उत्पलच्च अध्वंधारच्च ते आख्ये ययोः शस्त्रयोः स्ते उत्पलाध्वं धाराख्ये शस्त्रे तथा, यथाक्रमं दीर्घं कङ्गवक्त्रं भवतः । तच्च उत्पलाख्यं दीर्घवक्त्रं, अध्वंधाराख्यं कङ्गवक्त्रमित्यर्थः । उत्पलशब्दे न उत्पलपवाख्यं शस्त्रं गम्यते तन्मान्तरदर्शनात् । तस्य फलस्य उत्पलपवकारत्वादुत्पलपवमिति संज्ञितम् ॥ अधिकगद्बं धारा यस्य तत अध्वंधारं । हृतफलयोर्मध्ये फलसेष्य किञ्चिदधिक दैर्घ्यमिति वर्तते । तच्च अष्टाङ्गुलायतं उरसि अङ्गुल विस्तारं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

In the Aśvavaidyaka, the utpalapatra and vrīhipatra knives are recommended to be used in puncturing the veins in phlebotomy¹. “The surgeon who is practically acquainted with the methods of puncturing the veins, should use the utpalapatra and vrīhipatra knives for the purpose.”

When used for puncturing the large veins the knife is recommended to be encircled with thread at a short distance from the end to prevent unnecessary injury to the vessels by plunging the knife deeply².

Hippocrates similarly “guards his phlebotome in the surgical treatment of empyema, by having it wound round with a rag, leaving the breadth of the thumb nail at the point.”³

Both the utpalapatra and vrīhimukha knives are thus described in the Aśvavaidyaka⁴: The “vrīhimukha knife should be six aṅguli long and half an aṅguli wide. The utpalapatra should also be similarly made.”

The utpalapatra knife is recommended to be used for incising

¹ शस्त्रेणोत्पलपत्रेण ब्रीहिपदेण वा भिषक् ।

शिरावेधविधिं सम्यग् दृष्टकर्मा प्रयोजयेत् ॥

Aśvavaidyaka, XIV. v. 23.

² सूतकेण च संवेद्य मुखं शस्त्रस्य बुद्धिमान् ।

यथाप्रमाणं संस्थाप्य ततो विकावयेत् शिराम् ॥

Ibid, XV. v. 35.

³ Hippocrates, II. 258 Kuhn's Ed. and I. 88 Syd. Soc. Ed.

⁴ अद्वाहुलन्तु विस्तीर्णं कूर्यच्छस्त्रं पद्महुलम् ।

नाना ब्रीहिमुखं भव्यक् तथा चोद्यलपत्रकम् ॥

Aśvavaidyaka, XIV. v. 21.

the abdominal parietis of the horse; then a tube is to be pushed through the wound in the operation of paracentesis abdominis¹.

The phlebotome used by the Greeks is nowhere described in their books; but from considerations of all the various operations to which the instrument was put bears out the fact of its being a sharp pointed, double-edged and straight lancet. The phlebotome of the Greeks might have then resembled in shape the utpalapatra of the Hindus. It was used by the Greeks for various operations besides phlebotomy, as for the opening of abscesses such as the parulis or gum boil², puncture of cavities containing fluid as in opening the abdomen for ascites³, incising the tunica vaginalis as in excision of hydrocele sac⁴ and for dissecting out warts⁵ and sebaceous cysts⁶.

It is interesting to note that Pālakāpya⁷ mentions utpalapatra and describes it to be eight anguli long, one and a half anguli broad and double edged. He uses it for puncturing vessels etc.

¹ हृदयसप्ताधरे भागे ऊर्जभागे च नाभितः ।
अधोवा नाभितः कूर्यच्छेदनं चतुरङ्गुले ॥
शस्त्रेणोत्पलपवेण वामभागे विचक्षणः ।
एकमेवाङ्गुलं शस्त्रं कुचौचापि प्रवेशयेत् ॥
वेधत्रये ततस्तमिन् नालिकां वस्त्रवेष्टिताम् ।
प्रचिप्य गालयेहारि यावद्वैकोष्ठलाघवम् ॥

Aśvavaidyaka, LII. vs. 25, 26 and 27.

² Paul, VI. xxvii.

³ Ibid, VI. L.

⁴ Ibid, VI. lxii.

⁵ Ibid, VI. lxxxviii.

⁶ Ibid, VI. xiv.

⁷ ब्रीहिसुखप्रमाणसुत्पलपत्रं भेदनार्थं ।

7. ARDDHADHĀRA.

It is difficult to ascertain the exact shape of this knife. Some translate it as a "single edged knife,"¹ but it really means, as Dallaṇa explains, an instrument which has a sharp edge for half the length². It is also called eakradhāra. Vāgbhaṭa has a variant reading—adhyārddhadhāra—which means an instrument having a sharp edge for more than half the length³.

It is eight aṅguli long; the blade is two aṅguli long and one aṅguli wide, and the handle six aṅguli long. It is to be used for incision and division of parts of the body.

8. SŪCĪ OR NEEDLES.

Three needles are recommended to be used for applying sutures. They should be strongly made and rounded in shape. At one end they are flattened, grooved and pierced with an eye for the suture. The groove is said to have been intended to be the bed of the suture during stitching to prevent it from doing any harm to the tissue. In fleshy parts such as the thighs, a three ribbed needle, three aṅguli long, is advised to be used. For less fleshy parts and wounds about the joints, a similar straight needle but two aṅguli long should be employed, while for suturing the wounds of the stomach, intestines, scrotum and the vital parts of the body, preference is given to a needle curved like a bow, two and a half aṅguli long and having the pointed end

¹ Hœrnle's Translations of Suśruta Saṁhitā, Bibl. Ind. I. viii.

² अर्द्धधारमिति, अर्द्ध धारा यस्य तत् अर्द्धधार' चक्रधारमिति प्रसिद्ध' तच्च अष्टाङ्गुलायतं उरसि अश्युलं विस्तारं द्वाष्टांगुलफलं । अन्ये तथ्यर्द्धधारमिति पठन्ति, अधिकमर्द्ध' धारायस्य तत् अध्यर्द्धधारम् ।

³ See foot-note 5, P. 240.

Nivandha Saṅgraha, I. viii.

shaped like a paddy. In thickness, these needles are described to be equal to the stalk of the flower of mālatī (Jasminum grandiflorum). They should have sharp fine points and good shape¹. The needles are also recommended to be used for extraction of foreign bodies from the soft structures and also for evacuating abscesses².

¹ देशल्पमांसे सम्भौ च सूची व्रताङ्गुलवयं ।
आयता व्रग्गुला चक्षा मांसले वापि पूजिता ॥
धनुर्वक्त्रा हिता मर्मफलकोषोदरोपरि ।
इत्येतात्त्विधाः सूचीस्त्रणायाः सुप्रभाहिताः ।
कारयेन्मालतीपुष्पहन्ताग्रपरिमग्निलाः ॥

Suśruta Saṁhitā, I. xxv.

व्रतागृह दृढः पाशि त्रिस्त्रः सूचीत्वं सौवने ॥
मांसलानां प्रदेशानां व्रस्ता व्रग्गुलमायता ।
अत्यमांसास्थि सम्बिश्य ब्रणानां व्रग्गुलायता ।
ब्रीहिवक्त्रा धनुर्वक्त्रा पक्कामाशयमर्मसु ।
सा साईवग्गुल सम्भौ व्रतालायतुरग्गुला ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

तिस्तुणां सूचीनां विषयविशेषे आकारभेदानाह मांसलानामित्यादि ‘मांसलाना’ उर्बा-दीनां शरीर प्रदेशानां सौवनार्यं सूची, ‘व्रस्ता’ त्रिकोणविशिष्टा तथा व्रग्गुलमायता, अहुलवयदीर्घा कर्त्तव्या, असग्गास्त्राखल नयभागसैव न तु सर्वावयवस्तु । सूच्याः सर्वावयवस्तु हि साधारणतो व्रता कारत्वनिदृशादितिगम्य । असग्गा अपि गृह दृढः पाशलं सामान्योक्त्या कथितमेव अत्यमांसलस्थान संस्थितानां, सम्भ्रास्थि संस्थितानांच्च ब्रणानां सौवने व्रग्गुलायता, अहुलिद्वय दीर्घा, सूचीकर्त्तव्या, पक्काशये, आमाशये तथा ‘मर्मसु’ वस्त्यादिषु संस्थितानां ब्रणानां सौवने, ब्रीहि वक्त्रा, पाटलादि ब्रीहिवसुखा, ‘धनुर्वक्त्रा’ धनुर्वक्त्राकारा या सूची साईवग्गुला, अहाङ्गुलाधिक व्रग्गुल दीर्घा योज्येति योज्यं अत्रापि गृह दृढः पाशलं योजनीयं । साईवग्गुलेत्यनेन च्छेदः । सर्वत्यादि परेण सम्बन्धते ॥

Vāgbhaṭārtha Kaumudi, I. xxvi.

² सूचीकुशपदाटीमुखशरारीमुखान्मुखचिकूचकानि विस्तावणे ।

Suśruta Saṁhitā, I. viii.

In modern times, the surgeons use fully curved, half-curved and straight surgical needles. Waring¹ remarks : "The shape of the needle which ought to be used for closing an incision depends upon the depth and accessibility of the wound. In deep wounds, or wounds which are not readily accessible, curved needles will be found to be most useful, while for shallow cuts straight needles will be most convenient."

Suśruta makes mention of a javamukhī needle² (*lit.* having the sharp end shaped like a barley corn) for passing a double ligature smeared with eseharotic ointment, across the base of a tumour in opposite directions. Then by cutting through the nooses, and tying together the contiguous ends of the ligatures, the whole of the growth is enucleated and strangulated by them, exactly in the same way as in modern times a nævus is ligatured by means of a nævus needle. Cakradatta also quotes this description of the method of extirpating tumours by ligatures.

Erichsen says³ : "When the tumour is small, an ordinary double ligature may be passed across its base, by means of a common suture needle ; and the noose being cut and the thread tied on each side, strangulation will be effected. When it is of larger size, and of round shape, the most convenient method is that recommended by Liston. It consists in passing, by means

¹ Manual of Operative Surgery. By H. J. Waring, M.S., M.B., Third edition, P. 42.

² अर्जुदादिषु चोत्त्रिष्य मूले सूत्रं निधापयेत् ।

मूचीभिर्यववक्वाभिराचित् वा समन्ततः ।

मूले सूत्रेन वध्नीयाच्छ्वेते चोपचरिद्वरणम् ॥

Suśruta Saṃhitā, IV. xvii.

Cakradatta, Nāḍīvrāṇacikitsā.

³ Erichsen's Surgery, Vol. II, P. 73.

of long nævus needles, fixed in wooden handles, and having their eyes near their points, double whipeord ligatures in opposite directions beneath the tumour ; then cutting through the nooses, and tying together the contiguous ends of the ligatures until the whole of the growth is encircled and strangled by them."

There are many instances of the use of surgical needle by the Greek and Roman Surgeons. Needles of different sizes are recommended. Celsus mentions a large needle in describing the operation of suturing the abdominal parietis¹, and another, evidently a small needle, which is said to have been used in the treatment of staphyloma of the cornea². The needles were either round or three-eornered. "A few three-eornered needles of Roman origin have been found, although they are rare" (Milne³). Paul uses a needle in suture of the upper eyelid, and other modes of operating for triehiasis⁴, for the repair of wounds of the peritoneum⁵, and recommends a large sized needle containing a double thread to close the peritoneum in the operation for enterocele⁶.

Pālakāpya mentions sūcī or needles for stitching wounds⁷. They are eight aṅguli long, shaped like the tusk of an elephant and are either three ribbed, or four ribbed, or round, smooth and

¹ Celsus, VIII, xvi.

² Ibid, VII. vii.

³ Graeco-Roman Surgical Instruments, P. 75.

⁴ Paulus Aegneita, VI. viii.

⁵ Ibid, VI. lii.

⁶ Ibid, VI. lxv.

⁷ सूची सेवनार्थ । अष्टाङ्गुलं नागदत्ताकृति । चत्रसा चतुरसा वा दृढा समाहिता यथा शलाका वने वस्त्रविध्यर्थम् ।

strong. He reserves curved three-cornered needles for fleshy parts and round needles for skin, veins, nerves and arteries¹.

Caraka recommends the use of leeches, knife and needles for extracting blood from the piles². He also advises us to use needles for pricking the patches of leprous spots³ before the application of leeches for extracting blood.

9. KUŚAPATRA.

It is a form of knife resembling in shape the leaf of a kuśa grass (*Poa cynosuroides*)⁴. The instrument should be six aṅguli long (*Suśruta*) ; the blade measuring two aṅguli (*Vāgbhaṭa*)⁵

¹ याः सूच्यस्त्रिविधाः प्रोक्ताः शस्त्राध्याये संस्थिताः ।
नागदन्ताकुतिर्बन्ता विकोणा चेति निष्प्रयात् ॥
अस्याग्राश्रितं नागदन्तया मांसजं च त्रिकोणया ।
लक्ष्मायु धमनीस्थं च शिराजं चैव हत्तया ।
आहार्यं सर्वयन्त्राणां सूच्या सीवनभिष्ठते ॥

Pālakāpyā, III. i.

² जलौकीभिः तथा शस्त्रैः सूचौभिर्वा पुनः पुनः ।
ऋवर्त्मानं रुधिरं रक्ताश्चेभ्यः प्रवाहयेत् ॥

Caraka Saṁhitā, VI. ix.

³ प्रक्षितमल्पं कुष्ठं विरेचयेदा जलौकाभिः ।

Ibid, VI. vii.

⁴ कुशपवभिति, कुशपत्रतुल्यं कुशपत्रं तन्मानमाह :—
अङ्गुलैरुचकं विद्यादङ्गुलं फलमुच्यते ।
हृतं सग्रात् वाङ्गुलं मध्ये कुशपत्रस्य लक्षणम् ॥

Nivandha Saṁgraha, I. viii.

⁵ कुशाटी वदने श्राव्ये द्वाङ्गुलं सग्रात्योः फलं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुशाटीवदने द्वे शस्त्रे, स्त्राव्ये विस्तावणं विषये योज्ये । तथोः कुशाटी वदनयोः
फलं द्वाङ्गुलं, अङ्गुलदद्यं परिमितं सग्रात् ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

and the handle four aṅguli, but according to Bhoja, the handle is three aṅguli long. It is to be used for draining pus from abscess. The handle has a ring like ornamentation, about one aṅguli in diameter. Another variant reading describes the blade, the ring, and the handle to have the lengths of two, three, and two aṅguli respectively. This would make the total length of the instrument to be seven aṅguli; so evidently there is some lapsus calami in the second reading.

Cakradatta uses kuśapatra as a bleeding lancet and says¹: “Out of the twelve vessels that lie on the sides and underneath the tongue, select the two large bluish vessels on either sides of the tongue, raise them up by vaḍīśa or hook and puncture them by the kuśapatra knife and then, after bleeding, apply a paste of treacle and ginger to the wound”. In the Yogaratnākara², the author advises us to adopt this method of bleeding, in the treatment of tumours in the neck.

Pālakāpya mentions kuśapatra and describes it as being shaped like a kuśa grass³. It is nine aṅguli long—the handle being

¹ जिह्वाधः पार्श्वोऽधस्तां शिरा हादश कीर्तिंतः ।
तासां स्थूलशिरे क्षणे विद्यात् ते तु शनैः शनैः ॥
वडिशेण च संगटह्य कुशपवेण बुद्धिमान् ॥

Cakradatta, Galaganda Cikitsā.

² जिह्वाधः पार्श्वोर्म्लाच्छिरा हादश कीर्तिंतः ।
तासां स्थूले शिरे दे च क्षिन्द्याते च शनैः शनैः ।
वडिशेण च संगटह्य कुशपवेण बुद्धिमान् ।
सुन्ते रक्ते ब्रणे तथिन् दद्यातस गुडमाद्रकम् ॥

Yogaratnākara, P. 321.

³ नवाङ्गुलं कुशपतं । पश्चाङ्गुलं डत्तं । चतुरङ्गुलम् पवं । अध्याधीङ्गुलविशृत-
मुभयतो धारं । कुशपचाक्ति गम्भीरपाकभेदनार्थ षडङ्गुलं डत्तम् अध्याधीङ्गुलं पवं ।

Pālakāpya, III. xxx.

five or six aṅguli and the blade four aṅguli long. The blade is one and a half aṅguli wide and is sharp-edged on both sides (*i.e.*, double-edged). It is used for ineising deep abseesses.

10. ĀṭīMUKHA.

This instrument is described to have the shape like the beak of the jalavardhanī bird or āṭī¹ (*Turdus ginginiamus*),—a bird living in the marshes. It is six aṅguli long; the blade measuring two and the handle four aṅguli. So it is of the same size as the kuśapatra to which it also resembles in function. Bhoja is of opinion that its blade is one and the handle seven aṅguli long.

11. ŚARĀRIMUKHA.

This instrument is a pair of scissors resembling the faee of the long beaked bird ealled śarārī. Dallana describes two varieties of the bird, one with white shoulders, and the other with a red head. It is the former kind which is referred to here². Suśruta describes its length to be ten aṅguli³, while Dallana mentions the length to be twelve aṅguli.

¹ आटीमुखमिति, आटी जलवैनी नाम पच्चिविशेषः तम्भुखवम्भुखः यस्य तत् आटीमुखः तथाचोक्तः :—

ब्रह्मं सप्ताङ्गुलं विद्यात् तस्याये फलमिथते ।

आटीमुख प्रकारं हि फलमङ्गुष्ठमायतम् ।

Nivandha Saṃgraha, I. viii.

² शरारीमुखमिति, दीर्घचक्षुः पच्चिविशेषः स विविधः धवलस्त्वस्य; रक्तशीर्षश धवलस्त्वस्य शरारीति संज्ञा तम्भुखवम्भुखः तस्य शस्त्रस्य लोके कर्त्तरीति संज्ञा तात्र द्वादशाङ्गुलां चलत्पलासां कुर्यात् ।

Ibid.

³ दशाङ्गुला शरारीमुखी सा कर्त्तरीति कथ्यते ।

Suśruta Saṃhitā, I. viii.

It is recommended to be used for evacuating abscess¹, etc. Suśruta mentions karttarī as a synonym but Vāgbhaṭa counts it as a separate instrument. He describes karttarī as a pair of scissors used by the barbers for clipping hair and is said to have been necessary for dividing the nerves, ligaments and fine hairs².

12. ANTARMUKHA.

Suśruta describes another variety of scissors, used principally for evacuating abscesses. It is so named, for its straight cutting edges are within its curved claws³. It is said to be six aṅguli long and one and a half aṅguli broad⁴. It seems that the curvature of the blade varied widely; and Vāgbhaṭa describes a variety called

¹ स्वावे शरार्थासात्रिकूर्चिके ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

स्वावे विस्वावनविषये कर्मणि शरार्थास्या विकूर्चिके दे शस्त्रे योज्यः । तत्र शरार्थास्य
शरारीमुखं शरारी दीर्घं चच्छः पञ्चविशेषः तस्य मुखवदास्यं यस्य तत् शरार्थासां, तच्च
चलत् फलं दशाङ्गुलं दीर्घं कार्यं ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² स्नायु सूक्ष्म कचक्षेदे कर्त्तरी कर्त्तरीनिभा ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कर्त्तरीशस्त्रमाह स्नायुत्यादि कर्त्तरीनामशस्त्रं कर्त्तरौसट्टशं तच्च स्नायुक्षेदने सूक्ष्मकेश-
क्षेदने च योज्यं । कर्त्तरी काटारी इति यस्य प्रसिद्धिः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ अन्तर्मुखमिति मध्यमुखं तत्त्वचणमाह—

अष्टाङ्गुलप्रमाणेन जिञ्चघारेण चाप्तुतम् ।

शस्त्रमन्तर्मुखं नाम चन्द्राऽऽ इव चोहनं ।

Nivandha Saṁgraha, I. viii.

⁴ तद्वद्न्तर्मुखं तस्य फलमध्यैङ्गुलं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

arddhacandrānan¹ or “half-moon faced” scissors in which the blades are curved like the half-moon. It has the length of eight aṅguli, the blade measuring one and a half aṅguli. This is also to be used for letting out pus from abcesses.

Hārīta, however, mentions a śastra, called also arddhaeandra or half-moon, but he recommends its use for excising the prolapsed arms of a dead foetus to effect its delivery². This instrument can not but be a knife, for it seems difficult to cut off the arm, even of a foetus, with a pair of seissors. Moreover, antarmukha has never been credited with the power of excising the arm.

13. TRIKŪRCĀKA.

It has been translated in English as a thin-edged sharp instrument or trocar. Wise, Dutt and Hoernle agree to mean by it a trocar. But it can be better explained if we understand by the term an instrument consisting of three needles fixed on a round

अपरच्च विसावण शस्त्रमाह तद्दित्यादि तदत् कुशाटीवदनवत्, अन्तर्मुखं अन्तर्मुखं नाम
शस्त्रं साथे योज्यं तस्य अन्तर्मुखस्यफलं अध्यर्द्दमङ्गुलं स्यात् । आधि अधिकं अर्द्दं अध्यद्दं ।
सर्वेऽकमङ्गुलमित्यर्थः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

¹ अर्द्दं चन्द्राननं चैत तथाध्यङ्गुलं फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

अन्तर्मुखस्य प्रकारभेदमाह अर्द्दचन्द्राननमित्यादि एतत् अन्तर्मुखं, अर्द्दचन्द्राननं अर्द्द-
चन्द्राकारमुखच्च भवति, तदपि तदत्, कुशाटीवदनवत् साथे योज्यं । तच्च फले अर्द्दाङ्गुलं
अर्द्दाङ्गुलपरिमाणं फलमित्यर्थः । अर्द्दचन्द्राकारमुखलात् अस्य शस्त्रस्यापि अर्द्दचन्द्राननमिति
संज्ञेति वोध्यं ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² अथवार्द्दचन्द्रेण शस्त्रेणैव मृतगर्भस्य वाहयुगलं सञ्चिय वाहनिःसारथेत् ।

Hārīta Saṁhitā, III, li.

wooden handle¹. According to Suśruta, the length of the instrument is six aṅguli. But others describe it as eight aṅguli long, the blade and the handle measuring three and five aṅguli respectively². The distance between the edges is the breadth of a grain of rice. The end of the handle is ornamented with a circular metallic plate as a ring.

It is recommended to be used for evacuating abscesses and for draining blood from the nasal polypus.

Caraka³ mentions an instrument called kūreca and says:— “After fomenting and thus softening the rounded nodules (of leprosy) which are fixed and hard, by heated stones and fumigations through tubes, they are to be injured by the kūreca and the blood that oozes out, should be wiped away.”

Two other instruments are described by Vāgbhaṭa as being constructed on a similar principle. One is named kūreca and the

¹ चिकूर्चकमिति वयः कूर्चा यस्य तत् विकूर्चकम् । कूर्चः कूर्ची इति लोके ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² विकूर्चकमिति चयः कूर्चा यस्य तत् विकूर्चकम् तत्र तन्वान्तरम् :—

अङ्गुलानि तथाष्टौ च शस्त्रं कार्यं चिकूर्चकं ।
फलैरन्तर्मुखाकारैवङ्गुलैरन्तिं विभिः ।
एकेकस्य फलस्यैषामन्तरं ब्रौहिसम्प्रितम् ।
हन्तं पञ्चाङ्गुलायाम तदायं रुचकमूषितम् ॥

Nivandha Samgraha, I. viii.

³ स्थिरकठिनमण्डलानां स्तिनानां प्रस्तरप्रणाडीभिः ।
कूर्चेविघटितानां रक्तोत्क्लेशोपनेतत्यः ॥

Caraka Saṁhitā, VI. vii.

other, khaja. The kūreca¹, he describes as an instrument “consisting of seven or eight rounded sharp needles, four aṅguli long, nicely bound together by a cord and tightly fixed on a circular wooden handle.” He mentions its use in the operation of scratching to cure baldness and the brown and black spots on the face. For scarifying a bald spot, Cakradatta² uses needles, rough leaves, etc. “The khaja³,” Vāgbhaṭa continues, “consists of eight rounded needles having the sharp ends half an aṅguli long. It is to be introduced

¹ कूर्चोहत्तेकं पौठस्थाः सप्ताष्टौ वा सुवन्धनाः।
संयोज्य नौलिका व्यङ्ग केश शतेषु कुट्टने॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

सम्प्रति कूर्चाख्यां शस्त्रं लच्छित्युभाह सर्वत्यादि ताः सूच्यः सर्वेष ब्रताः वर्तुलाः तथा चतुरङ्गुलाः चतुरङ्गुलदीर्घाः कूचः इत्युच्यन्ते। ताः सूच्यः पुनः कौटुम्बाः? ब्रतेकपौठस्थाः ब्रते वर्तुले एकस्मिन् पृष्ठे संस्थिताः, एकं ब्रताकारं काष्ठफलकं परिवेष्य स्थिता इत्यर्थः। तथा सप्तसंख्यका अष्टसंख्यका वा, तथा शेभनं रज्जुदिळितं वन्धनं यासां तास्थाविधाः सुवन्धनाः। स कूर्चः नौलिकादिषु रोगेषु कुट्टने कुट्टनार्थं संयोज्यः प्रयोज्य इत्यर्थः। कुट्टनं आँच्छान इति लोके। नौलिकादयो वन्ध्यमाणा केशशातः केशानां पतनं।

Vāgbhaṭārtha Kaumūḍī, I. xxvi.

² अवगाढपदचैव पुच्छित्वा पुनः पुनः।

Cakradatta, Kṣudraroga Cikitsā.

अवगाढपदमिति गम्भीरपदं यथास्यात् तथाः सूचीनखरञ्जन्यादिभिः पुच्छित्वा * * *

Tattva Candrikā, ibid.

³ अर्द्धाङ्गुलेमुखैर्ब्र्त्तेरटाभिः कण्ठकैः खजः।

पाणिभ्यां मथ्यमाणेन नाशात्तेन हरेदस्त्रक्॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

खजसंज्ञकशस्त्रमाह अर्द्धाङ्गुलसुखैरित्यादि अर्द्धाङ्गुलप्रमाणं सुख वेषां ते अर्द्धाङ्गुलमुखा सैव अर्द्धाङ्गुलमुखैः वैतैः वर्तुलैः अष्टाभिः अष्टसंख्यकैः कण्ठकैः क्षतं शस्त्रं खज उच्यते। तेन खजाख्येन शस्त्रेन पाणिभ्यां हस्ताभ्यां मथ्यमाणेन आलोड्यमाणेन नाशात् नासिकाया अस्त्रक्रक्तं हरेत्, निर्हरेदित्यर्थः।

Vāgbhaṭārtha Kaumūḍī, I. xxvi.

into the nostrils and turned to and fro with both hands to bleed the nasal polypi."

The Greeks and Romans used a similar instrument for identical purpose. It was called katiádion, measuring a blade of grass, and was used for opening abscesses of the womb and tonsils, drawing blood from the inside of the nose and perforating the foetal cranium.

In India, the practice of drawing blood from the nasal polypus by blades of grass is still in vogue; and Aræteus mentions it as a common mode of scarification in ancient Greece also¹. "On the next day we are to abstract blood from the inside of the nostrils, and for this purpose push into them the long instrument named Katiádion, or the one named Toryne, or in want of these we must take the thick quill of a goose, and having scraped the nervous part of it into teeth like a saw, we are to push it down the nostrils as far as the ethmoid cells, then shake it with both hands, so that the part may be scarified by its teeth. Thus we shall have a ready and copious flow of blood; for slender veins terminate there and the parts are soft and easily cut. The common people have many modes of scarification, by rougher herbs and dried leaves of the bay, which they introduce with the fingers and move strongly." Paul² opens the vessels in the nostrils with the reed called typha.

14. KUTHĀRIKĀ.

It is a small instrument shaped like an axe, so called from its resemblance to kuthāra, an axe which is still used in India

¹ Extant works of Aræteus, P. 460.

² Paul, vol. II. Sec. ix.

for cutting wood¹. Vāgbhaṭa says² that “the base of the blade is thicker and broader than the end and is fitted to a handle, seven and a half aṅguli long. The blade which is shaped like the tooth of a cow, has the width of one aṅguli.” Bhoja describes the width of the blade to be a half aṅguli³. It is recommended to be used for puncturing vessels in the following manner⁴:—“Hold the handle with the left hand and put the blade on the vessel resting on a bone. Raise the instrument a little upwards and then strike over the thick base of the blade with the downward strokes of the middle or index finger, when let go

¹ For figure of Kuṭhāra as used in Ancient India, see Pl. xxii in Ferguson's Tree and Serpent Worship.

² पृथुः कुठारी गोदन्तसटशार्द्धाङ्गुलानना ।
तयोर्द्वंदग्णया विष्टेदुपर्यस्यां सिरां स्थितां ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुठारिका संज्ञकं शस्त्रमाह पृथुरित्यादि कुठारी पृथुः स्यात् । कुठारिका नामशस्त्रं पृथुः स्थूलसूलं स्यादिव्यर्थः । तथा गोदन्तसटशार्द्धाङ्गुलानना गवां दन्तः गोदन्त स्तसटशं तुल्याकारं अर्द्धाङ्गुलायतं आननं सुखं यस्याः सा तथा विभया तथा कुठार्था ऊर्द्धदग्णया अस्यां उपरिस्थितां सिरां विशेत् । तद्गुणं वामहस्तेनोच्चीकृत्य कुठार्थासुखं शिरोपरि संस्थाप्य दक्षिनाङ्गुष्ठतर्जनीभ्यां कुठारिकामस्तकमभिहत्य सिरां विशेत् ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ कुठारिकेति कुठारतुल्या कुठारिकाः—

कुठारिकाया वन्तं स्यात् सार्द्धसप्ताङ्गुलायतं ।
फलमर्द्धाङ्गुलायामं गोदन्तसटशं समम् ॥

Nivandha Saṅgraha, I. viii.

⁴ तथा सध्यमयाङ्गुल्या वैद्योऽङ्गुष्ठ विसुक्तया ।
ताडयेदुत्थितां ज्ञात्वा स्पर्शाद्वाङ्गुलं पीडनैः ॥
कुठार्था लचयेन्मध्ये वामहस्त गृहीतया ।
फलोद्देशे सुनिष्कर्म्य शिरां तदच्च मीचयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

foreibly from the under surface of the thumb". Cakradatta¹ also advises us to use it in a similar manner. To open the veins in fleshy parts, Vāgbhaṭa recommends the vrīhimukha knife, while the kūṭhārīkā is advised to be used in venesection on bony structures.²

Pālakāpya³ mentions the kūṭhāra and describes its shape to be like an axe. It is to be used for excision and scarification. He describes another śastra called vatsadanta (*lit.*, the calf's tooth); it is ten aṅguli long; and the mouth of the instrument is one and a half aṅguli broad. It is also to be used for excision.

"Bleeding from the jugular vein, he (Albueasis) describes much in the same way that it is now praetised by veterinary surgeons, namely, by placing a sort of sealpel bent at the point, whieh he calls fissorium, upon the vein, and striking the instrument with a hammer or some such body. He gives drawings of variously shaped laneets for opening the veins of the arm."⁴

"Ferriers bleed with a fleam, which, though apparently a clumsy method of operating, is ecertainly safer than the laneet in

¹ वामहस्तेन विन्यसत् कुठारीमितरेण तु ।

ताडयेन्नध्यमाङ्गुत्याङ्गुष्टविष्ट्वसुक्तया ॥

Cakradatta Śirāvyādhādhikāra.

² मांसले निचिपेदे शे ब्रीहामं ब्रीहिमावकम् ।

यवाईमस्थूमुपरि शिरां विध्वन् कुठारिकाम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

³ कुठाराकृति कुर्यात् । कुठारी शस्त्रपञ्चेदनार्थं । वत्सदलाकृति वत्सदलं दशाङ्गुलम् । एकेकमथ्य इङ्गुलमुखम् । एवमेतानि च त्रीण्यपि यथायोगं प्रच्छन्नार्थं ।

* * * * *

कुठाराकृतिशस्त्रे ण ततसं प्रच्छयेन्निष्वक् ।

तातिगाढं न च लघुं न घनं विरलं न च ॥

Pālakāpya, III. iii.

⁴ Albucasis Chirurg. ii. 97; also see Adam's Commentary on Paul, VI. ix. 323.

unknown hands." "In bleeding with a fleam, the near side is most convenient. In skilful hands, there is no occasion for a blood stick, as the fleam may be struck with the right hand if it is made broad and round at the back. It also may be made much smaller and neater than that generally employed". There is a drawing of such an improved fleam which much resembles in appearance the kūthārī of the Hindus. "A fleam is rather more convenient instrument in bleeding, either from the arm or thigh, as the vein is somewhat apt to roll when a lancet is used."¹

15. VRĪHIMUKHA.

It is described as a kind of trocar², the sharp end being pointed and shaped like a grain of paddy. It is six aṅguli long, the handle being two and the blade four aṅguli (Bhoja). But Vāgbhaṭa³ describes the length of the blade to be one and a half aṅguli.

It is advised to be used for paracentesis abdominis in abdominal dropsy. Suśruta says :⁴ "The friends of the patient should

¹ White's Compendium of the Veterinary Art, 1851, 18th ed. P. 342.

² व्रीहिसुखभिति व्रीहिसुखभिव सुखमस्य व्रीहिसुखं तत्र भोजः—
शस्त्रं व्रीहिसुखं कार्थ्यमङ्गलानि षड्यतम् ।
द्वाङ्गुलं तस्य वन्तं सग्रात् तत्फलं चतुरङ्गुलम् ।
तन्मुखं व्रीहिविस्तारं तनुसंगूढकण्ठकम् ॥

Nivandha Saṅgraha, I. viii.

³ * * * तथाध्यर्द्धाङ्गुलं फले ।
व्रीहिवक्रं * * *

Aṣṭāṅga Hṛday Saṁhitā, I. xxvi,

⁴ उद्कीदरिणस्तु वातहरैलाभ्यक्तस्योश्णीदक्षिन्नस्य स्थितस्यातैः सुपरिगृहीतस्याक्षात्-परिवेष्टितस्याधो नाभेष्वामतश्यतुरङ्गुलमपहाय गोमराज्या व्रीहिसुखेनाङ्गुष्ठोदर प्रमाणमवगाढं विश्वेत् ॥

Suśrūtā Saṁhitā, IV. xiv.

hold him under the axilla. Then the abdomen is to be tapped by the vrīhimukha knife at a point, four aṅguli distant on the left side from the median line, underneath the navel." Vāgbhāṭa¹ advises us to surround a broad bandage round the abdomen before tapping it by the instrument, whieh he recommends to be introduced up to one aṅguli. Cakradatta² refers to works on surgery for the surgieal treatment of aseites. A small ineision is directed to be made before the punture.

In the Aśvavaidyaka, for this operation, the utpalapatra knife is reeommended ; an ineision four aṅguli long is direeted to be made above or below the navel of the horse, and then the end of the knife is to be plunged into the abdominal eavity up to one aṅguli.³ The vrīhimukha is also advised to be similarly used.⁴

Hippoerates speaks of evaeuating the fluid in paraeentesis abdominis with an instrument whieh Camper thinks must have been a kind of trocar.⁵

1

सजले जठरे तैलैरभ्यक्तस्यानिलापहैः ।
स्विन्नस्योणास्वुना कचमुदरे परिवेष्टिते ॥
वड्क्षिद्रोदितीस्याने विष्वे दङ्गुलमाचकम् ।
निधाय तम्भिन्नाङ्गीच्च स्वावयेऽमध्यसः ॥
अथास्य नाडीमाक्ष्य तैलेन लवणेन च ।
ब्रणमध्यज्य वड्हा च वेष्टयेद् वाससोदरम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, IV. xv.

² जातं जातं जलं साव्यं शास्त्रोक्तं शस्त्रकर्म्म च ।

Cakradatta, Udaracikitsā.

³ See foot-note, 1. p. 242.

⁴ See foot-note. 4. p. 241.

⁵ See the Commentary on Paul. By Adams, vol. II, P. 338.

It is also to be used for puncturing the vessels in phlebotomy (*Vāgbhāta*)¹ especially in the fleshy parts of the body.² Cakradatta uses *vrihimukha* in phlebotomy and says: "The sharp end of the *vrihimukha* should be kept under the palm between the thumb and index finger and is to be thrust into the seat of puncture."³

Suśrnta directs us to use it in tapping the hydrocele:⁴ "Then the hydrocele is to be wrapped round with a bandage. The fluid is next to be drained by tapping it with a *vrihimukha* on the lower part of the serotum, little externally to the suture." Similar directions are given in the *Yogratnākara*.⁵ Cakradatta also gives a similar description.⁶

¹ ब्रीहिवक्तं प्रयोज्यच्च तत्सिरोदरयोर्विधेः ।

Aṣṭāṅga Hṛdaya Saṃhitā. I. xxvi.

ब्रीहिसुखात्यं शस्त्रं आह ब्रीहिवक्तमित्यादि ब्रीहर्वक्तमिव वक्तं यस्त तत् ब्रीहिवक्तं ।
ब्रीहिसुखं यतश्स्त्रं तत्सिरानां व्यधे व्यधने तथा उदरस्त जलोदरस्त व्यधे सावणार्थं
योज्यं ।

Vāgbhāṭārtha Kaumudī. IV. xxvi.

ताड्यन् पौड्येचैनां विधे द ब्रीहिसुखेन तु ।

Aṣṭāṅga, Hṛdaya Saṃhitā, I. xxvii.

² मांसले निःचिपेद्वै श्रे ब्रीहात्यं ब्रीहिमात्रकम् ।

Ibid.

मांसलेष्ववकाशेषु यवमात्रं शस्त्रं निदध्यादतोहन्तैष्वर्द्धयवमात्रं ब्रीहिमात्रं वा
ब्रीहिसुखेन ।

Suśrutā Saṃhitā. IV. viii.

³ ततो ब्रीहिसुखं व्यधप्रदेशे न्यस्त्य पौड्येत् ।

अङ्गुष्ठतर्जनीभ्यस्तु तलप्रक्षादितं भिषक् ॥

Cakradatta Śirāvyādhādhikāra.

⁴ See foot note 5, P. 123.

⁵ संस्वेद्य मूत्रप्रभवं वस्त्रखण्डेन वेष्टयेत् ।

सौवन्या पार्श्वतोऽधस्ताविध्येत् ब्रीहिसुखेण वै ॥

Yogaratnākara.

⁶ मंस्वेद्य मूत्रप्रभवां वस्त्रपट्टेन वेष्टयेत् ।

सौवन्याः पार्श्वतोऽधस्तादिध्याद्ब्रीहिसुखेण वै ॥

Chakradatta Vṛddhi Cikitsā.

Paul describes the operation but he recommends a sharp-pointed knife or laneet instead of a trocar. He says: "Wherefore we must make the patient stand erreet; or if this can not be done, we must cause him to be seated; * * *. We give orders to the assistants standing behind to press with their hands and push downwards the swelling to the pubes. Then taking a sharp-pointed knife or laneet, if dropsy be among the intestines, in the perpendicular line of the navel, and about three fingers' breadth distance from it we divide the hypogastrium as far as the peritoneum."¹ Celsus mentions that some perform it at a spot four fingers' breadth below the navel in the left side, and recommends us to use a perforator, the point of which should be about the size of the third part of a fingers' breadth.² Vegetius, the veterinary surgeon, recommends paraeentesis for the dropsy of cattle.³ The Arabic authors Avicenna,⁴ Serapion,⁵ Albucasis,⁶ Haly Abbas,⁷ and Rhases,⁸ give similar descriptions.

In modern times, we perform the operation in the same way. "It is necessary in certain conditions to tap the abdomen in order to withdraw fluid which has accumulated there and this is usually done by means of a special trocar and canula. The site for tapping is selected, the usual spot being in the middle line, half-way between the umbilicus and the pubes. A

¹ Paulus Ægineta, Bk. VI, l. Syd. Soc. Ed.

² Celsus. vii. 15; ii. 10.

³ Vegetius. Mulom. iii. 25.

⁴ Avicenna, iii. 14; iv. 13.

⁵ Serapion. iv. 7.

⁶ Albucasis: Chirrug. ii. 54.

⁷ Haly Abbas, Pract. ix. 41.

⁸ Rhases, Cont. xix.

small puncture about one-third of an inch long is made with the knife at the spot selected. The trocar and canula to which the rubber tubing is attached, are then thrust through the abdominal wall into the peritoneal cavity.”¹

The Greeks did not describe the operation of tapping the hydrocele. They always preferred the open incision to puncture. Paul uses a knife for making the skin incision, but when the tunica vaginalis is laid bare, he divides it through the middle with a lancet for bleeding.² Some of the Arab authors mention the operation of puncturing the scrotum for hydrocele. If the patient be timid, and do not choose to submit to open incisions, Albucasis advises the surgeon to let out the water either with a scalpel or the instrument used for tapping in dropsy. He states, however, that the water will collect again after this operation.³ Rhases also describes this operation.⁴

In modern times, trapping for hydrocele is still practised. “When trapping a hydrocele the patient should be sitting up in a chair * * *. The scrotum, having been cleansed, is grasped from behind by the left hand * * *. A spot, free from any large veins, is selected on the anterior and lower part of the swelling, and the trocar and canula introduced with sharp stabbing movement.”⁵

Pālakāpya⁶ describes vrīhimukha as shaped like a grain of paddy and recommends it for scission and excision of muñja.

¹ Operations of General Practice. By Corner and Pinches. P. 109, 2nd ed.

² Paulus Aegineta, VI. lxii.

³ Albucasis. Chrug. ii. 62.

⁴ Rhases. Cont. xxiv.

⁵ Operations of General Practice, P. 145.

⁶ सवणं पाटनं चैव कुर्याद्वीहसुखेण तु ।

16. ĀRĀ OR AWL.

It is a long sharp needle in handle, so called from its resemblance to the shoe-maker's instrument known as awl. "It has a total length of sixteen aṅguli, with a sharp end of the size of a sesamum seed. The handle is tapering like a cow's tail and is equal in circumference to the young stem of Dūrvā (Unodon Daetylon)" (Bhoja)¹. Suśruta mentions its length to be six aṅguli. Vāgbhaṭa describes the length to be one aṅguli, the basal half being round, and the terminal half, four cornered and sharp pointed. The terminal part is introduced into the inflammatory swellings to confirm the diagnosis of suppuration. It is also to be used to drain the congested blood vessels in the matrix of the nails as a result of traumatism².

¹ आरेति, आरेव आरा असिः चर्मकाराणां शस्त्रं । तव तन्नान्तरम् :—

आरा इर्षाङ्गुलयामा कर्त्तव्या तु विशम्पते ।

तिलप्रमाणन्तु फलं तसाः कार्यं समाहितं ।

दुर्ब्लाङ्गुरपरीणाहं छन्दं गोपुच्छसन्निभं ।

Nivandha Saṃgraha, I. viii.

² व्यधने कर्णपालीनां युथिका मुकुलानना ।

आराङ्गुल बृत्तासग्न तत्प्रवेशो तथोऽर्द्धतः ॥

चतुरस्ता तथा विष्वेच्छोयं पक्षाम संशये ।

कर्णपालीच वहलां वहलाया न च शसृते ॥

सूचा विभागशुषिरा व्याङ्गुला कर्णवेधनी ।

Aṣṭāṅga Hṛdaya Saṃhitā. I. xxvi.

सम्प्रति कर्णपालि व्यधन योग्यानि शस्त्राणि वक्तुमाह व्यधने इत्यादि कर्णपालीनां कर्णलतानां व्यधने व्यधनविषये युथिका युथिका नाम शस्त्रं योज्यं । कीटशी ? मुकुलानना मुकुलवत् प्रकतल्वात् युथिका मुकुलवत् आननं मुखं यस्याः सा तथाविधा । आरेत्यादि अर्जाङ्गुलं परिमानं छन्दं वर्तुलं आस्यं मुखं यस्याः सा तथा अर्जाङ्गुलबृत्तास्या, तथा स एव अर्जाङ्गुलप्रमाणः प्रवेशः प्रवेशनं यस्याः सा तथाविधा तत् प्रवेशा तथा ऊर्द्धतः बृत्ताङ्गुलादुपरिष्टात् तथा अर्जाङ्गुल परिमाणैव चतुरस्ता चतुर्कोणा सा आरा कथ्यते ।

It is also said to have been used for perforating a thick lobule of the ear, though for this purpose another instrument called *karṇa-vedhāṇī* or ear-perforator—a needle specially meant for perforating the lobules of the ears,—is mentioned. It is three anguli long, having a slit or eye in the three-fourths of its length. The barbers used a similar needle to perforate the ears on the ceremony of tonsure.

For piercing the lobule of the ear, another instrument is mentioned. It is called *jūthikā*, from its end resembling in shape the eonial bud of *jūthikā* flower (*Jasminum Auriculatum*).

Suśruta uses *ārā* or *pāṇimantha* to perforate the bone in diseases of the medullary canal caused by the obstructed and deranged air¹. He next introduces one end of a tube open at

एतेन आरायाः फलं एकाङ्गुलपरिभितमिति फलति तव प्रथमाङ्गुलं बृत्तं सपराङ्गुलं चतुरस्त तयोरुभयभागश्चैर्मध्ये अगस्थश्चतुरस्तो भागः प्रवेशयोग्य इति सूचितं । तया आराया पक्षाम संशये अयं शोथः पक्ष आमोवेति संशये सति तादृशं शोथं विधेष्ट, तथा वह्लां अतिमांसलां कर्णपालीच्च तया विधेऽदिति योज्यं । वह्लामित्यन्तेन च्छेदः । वह्लायामित्यादि वह्लायाः अतिमांसलायाः कर्णपाल्याः व्यधने कर्णवेधनी नाक्षी सूचीं च शस्ति । कीदृशी ? चिभागशुषिरा, तिभागः शुषिरं शून्यं यस्याः सा तथाविधा विभागशुषिरा तथा त्राङ्गुला अङ्गुलवयदीर्घा । न केवलमारा वह्लायाः कर्णपाल्या व्यधने शस्ति अपि तु कर्णवेधनी नाक्षी सूचीं च शस्ति इत्यर्थः । कर्णवेधनीं सूचीं अस्यादेशीया नरसुन्दरा कर्णवेधनार्थं व्यवहरन्ति । अतोऽपं वाहुत्त्ववर्णणेति ।

Vāgbhaṭārtha Kaumūdī. I. xxvi.

¹ निरुद्धेऽस्थनि वा वाग्नौ पाणिमयेन दारिते ।

नाडीं दत्तास्थनि भिषक् चुषयेत् पवनंवली ॥

Suśruta Samhitā. IV. iv.

निरुद्धे इत्यादि । लड्मांसं शस्त्रेण विपाश्य अस्थि पाणिमयेन अराशस्त्रेण विहा तव रन्धे हिमुखीं नाडीं प्रणिधाय सुखमारुतं चूपणेन लवनापकर्षणं करणीयमिति ।

Nivandha Saṅgraha. IV. iv.

both ends into the eanal through the hole in the bone, while through the other end the surgeon sueks out the air by his mouth.

For perforating the ears of the elephants, a similar needle is recommended by Pālakāpya. It is known as karmāra or nālī.

17. VETASAPATRAKA.

It is a long sharp cutting instrument shaped like the leaf of the rattan (Calamus Rotang). Its edge is finely serrated and very sharp. The blade and handle are equal in length, measuring four aṅguli. Bhoja says: "The blade is one aṅguli wide"¹. It is said to have been used for puneturing vessels in phlebotomy².

18. VĀPIŚA OR SHARP HOOK.

In shape it is deseribed to resemble the ordinary fish-hook. Bhoja deseribes the total length to be six aṅguli, its hook being half an aṅguli and its handle five and a half aṅguli long. The end is bent; the curvature varies and may be shaped like a half-moon³.

¹ वैतसपचमिति, वैतसपवमिव वैतसपवमत्र भोजः—

तीक्ष्मझुलं विस्तारं चतुरझुलायतं ।

अझुलानि तु चत्वारि छ्वलं कार्यं विजानता ॥

Nivandha Saṃgraha, I. viii.

² वैतसं व्यधने ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

वैतसपवादि शस्त्रमाह वैतसमिल्यादि वैतसं वैतसपवं नामशस्त्रं सिरादीनां व्यधन कर्मणि-योज्यं । वैतसपवद्वन्तुरलासस्य वैतसं वैतसपवं वैत्ति संज्ञा ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ वडिशमिति वडिशतुल्यं वडिशं मत्सपवेधनीमाहः । तत्र तन्वात्तरं :—

वडिशे चापि कर्त्तव्ये प्रमाणे तु षड्झुले ।

स्थानतन्तु तयोरेकमेकं नात्यायतं भवेत् ।

Suśruta says¹: The end of the hook is sharply edged and is said to have resembled the new leaf of Java (Hordeum vulgare).

It is recommended by Suśruta² to be used for extraction of foreign bodies, e.g., the extraction of stone from the urethra. Its use is also mentioned for transfixing the membranous expansion in the operation for pterygium³ and for fixing and dragging the nula and tonsil before the performance of any operation on these parts⁴. Cakradatta⁵ mentions its use for fixing a growth, before its excision by the knife.

अर्द्धापच्चाङ्गुलं बृन्तं श्रिषं कार्यं सुखं तयोः ।
अर्द्धचन्द्राकृति वक्त्रं कार्यं नात्यानतस्य तु ।
स्वानतं नामयेत् तत्र वडिश्चभिषग्वरः ।
बृन्ताग्योरन्तरं सप्ताद् यावद्वर्द्धाङ्गुलं मतं ।

Nivandha Saṅgraha, I. viii.

¹ वडिशोदन्तशङ्कुशानतागे तीक्ष्णकण्टक प्रथमयवपवसुखे ।

Suśruta Saṁhitā, I. viii.

² यटच्छया वा मुत्रसार्गप्रतिपन्नामन्तरासक्तां गुक्राम्भरौ श्वर्करां वा स्रोतसा अपहरेत् एवं चाशक्ये विद्यार्थ्ये वा नाड़ीं शस्त्रेण वडिशेनोद्दरेत् ।

Suśruta Saṁhitā, IV. vii.

³ ग्रहणेशुग्धिकार्मादेवडिशः सुनताननः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi

वडिशस्त्रमाह यहणे इत्यादि सुषु नतं अङ्गुशवत् नमक्तं आननं सुखं यस्य स तथाविधः सुनताननः वडिशं मत्स्यविधनवत् वडिशेनाम शस्त्रं सप्तात् । स च शुग्धिकार्मादेवर्ग्यहणे योज्यं । आदिपदेष उपजित्रिकादे परियहः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

⁴ पिङ्कासुत्तमाल्याच्च वडिशेनोद्दरेडिष्पक् ।
उड्डल्य मधुसंयुक्तैः कषायैरवचूर्णयेत् ॥

Suśruta Saṁhitā, IV. xxi.

⁵ उत्तमाग्वानुपिङ्कां संक्षिप्त वडिशेनुताम् ।

Cakradatta, Śukradoṣa Cikitsā.

It was also used for fixing any growth in the eye, previous to its excision by the *maṇḍalāgra*¹. For this purpose the Greeks used the vulsellum (myzon). Aetius says: "If there is a large and malignant excreseeenee in the angle of the orbit, the enlarged part must be seized with vulsellæ and cut off."²

Evidently *vadiṣa* was used on many oeeasions when in modern times we use the dissection forceps to steady a part before excision.

Vadiṣa is deseribed in the *Aśvavaidyaka*³ to have been similarly used during the operation of pterygium in horses.

*Pālakāpya*⁴ mentions *vadiṣa* whieh is deseribed as eight anguli long, the end being rounded like a wheel. It is to be used for raising the membranes of the eye globe.

Sharp hooks were used by the Greeks and Romans, for similar purposes. The use of the sharp hook for fixing the pterygium is mentioned by Celsus⁵, Aetius⁶, Paul⁷ and Albueasis⁸.

Its use in the exeision of the tonsil is mentioned by Paul⁹. After the patient being plaeed in the proper position, he narrates: "We take a hook (tenaeulum) and perforate the

¹ See foot notes 1, 2 and 3, P. 227.

² Aetius. vi. 74.

³ चितौ निपाल्य तुरगं ततोनेव प्रसारयेत् ।

कृतकर्मा भिषविवान् वडिश्नाचिवर्त्म नि ॥

Aśvavaidyka, XXX. v. 32.

⁴ वडिश् च क्रायमटाह्नुलप्रमाणमच्छोः पटलोद्धरनार्थ चेति ।

Palakāpya, III. xxx.

⁵ Celsus. VII. vii.

⁶ Aetius. Tet. ii, iii, 60.

⁷ Paul. VI. xviii.

⁸ Albucasis. Chirrug. ii, 16.

⁹ Paul. VI. xxx.

tonsil with it, and drag it outwards as much as we can without drawing its membranes along with it, and then we cut it out by the root with the scalpel suited to the hand, called ancylotomus, for there are two such instruments, having opposite characters”.

19. DANTA ŚĀNKU OR TOOTH-SCALER.

Its head is half an aṅguli long. It is quadrangular in shape and has a sharp edge. Suśruta¹ describes the end as slightly bent, sharp and shaped like the fresh leaf of Java. Bhoja² describes the end to be like that of the vrīhimukha.

Vāgbhaṭa³ describes a similar instrument called dantalekhana or tooth-scaler. It is also quadrangular in shape, one side being sharp-edged and the opposite side little lengthened. It is

¹ See foot note 1. P. 265.

² एवं हि क्रियते एतौ दशशङ्कुर्विजानता ।

शङ्कु वच्च सुखं तस्य कार्यमद्वाङ्गुलायतम् ॥

चतुरस्त्रं समञ्चेव तीच्छधारं समाहितं ।

वृत्तायं तस्य कर्तव्यं शस्त्रं ब्रीहिसुखाङ्गति ।

कपालिकां शर्करांच्च दन्तस्थानेन शोधयेत् ॥

Nivandha Saṅgraha, I. viii.

³ एकधारं चतुर्कोणं प्रवृद्धाङ्गति चैकतः ।

दन्तलेखनकं तेन शोधयेद्दन्तशर्करान् ॥

Aṣṭāṅga Hṛdaya Saṅhitā, I. xxvi.

दन्तलेखन शस्त्रमाह एक धारमित्यादि एका घारा यस्य तत् एकधारं चत्वारः कोणा यस्य तत् चतुर्कोणं कोणः कोणा इति यस्य प्रमित्तिः तथा एकतः एकदेशात् प्रवृद्धा वर्डनशीला आङ्गतिः आकारो यस्य तत्त्याविधं प्रवृद्धाङ्गति दन्तलेखनं दन्तलेखनाग्न्यं शस्त्रं साम् तेन दन्तलेखनाखिण शस्त्रेण दन्तशर्करान् दन्तनिवडान् शर्कराश्वान् लेखयेत् कर्षयेदित्यर्थः । दन्तालिख्यने अनेनेति दन्तलेखनं दन्तशर्करा पायरि इति नोके ।

Vāgbhaṭārtha Kaumūḍī, I. xxvi.

recommended to be used for the extraction of sordes and tartar from the teeth ¹.

The procedure of the operation of tooth-extraction is not described in detail in the medieval books of the Hindus. But the operation seems to have been well known, for Suśruta distinctly advises the students to practise the operation of extraction on the fruits of Panas (Atrocarpus Integrifolia), Vimbī (Cephalandra India), Vilva (Ægle Marmelos) and on the teeth of the dead animals ². He also advises us to extract the wisdom teeth and to apply cautery to their sockets ³. Also when a tooth becomes loose he directs us to extract it and apply cautery to the socket ⁴. In the treatment of sinus caused by carious tooth, he advises us to extract the tooth, otherwise the sinus would extend down to the inferior maxillary bone ⁵.

¹ शस्त्रेण दन्तवैदर्भं दन्तसूलानि शोधयेत् ।

* * * *

अहिंसन् दन्तसूलानि शक्तरामुङ्गरेद् भिषक् ।

Suśruta Saṁhitā, IV. xxii.

² See foot note 2. P. 280.

³ उद्धृत्याधिकदन्तन् ततोऽग्निसवचारयेत् ।

क्षमिदन्तक-वचापि विधिः कार्यो विजानता ॥

Suśruta Saṁhitā, IV. xxii.

⁴ चलमुङ्गत्य च स्थानं विद्वैच्छुषिरस्त्र च ।

Ibid.

⁵ यन्दन्तमधिजायेत नाडी तंदन्तमुङ्गरेत् ।

क्षिला मांसानि शस्त्रेण यदि नोपरिजीभवेत् ॥

शोधयित्वा दहेद्वापि क्षारिण ज्वलनेन वा ।

भिनच्युपेत्तिने दन्ते हनुकास्थि गतिप्रवृत्तं ॥

समूलं दशनं तस्मादुङ्गरेद् भग्नमस्थि च ॥

उद्धृतेतूरे दन्ते सश्लिं स्थिरवन्धने ॥

Ibid.

Pālakāpya¹ mentions the extraction of tooth of the elephant by means of enīpada which is an iron bar, thirty-two aṅguli long and equal to the tooth in circumference.

Paul says² : “The laminæ which unite to them (the teeth) we may remove as may appear proper, with the concave part of a speculum, a respiratory, or a file.” The operation of tooth-extraction was however, not liked by the ancient Greeks as eases in which the operation proved fatal, occurred in their practice. Cælius Aurelianus, Herophilus, and Galen disapprove in general of the operation, except in extreme cases.

It would, no doubt, be interesting to know that in ancient India, the Hindus knew how to make false teeth to be used by men who have lost them either by accident or by extraction by the dentists. In 1194 A.D., Sahabuddin defeated Jayacandra in battle, “and the incident of the body of the rāja being recognised by his false teeth³—a circumstance which throws some light on the state of manners” is well known.

20. EṢĀNĪ OR SHARP PROBES.

“The probes”, says Caraka⁴, “are of two kinds, the hard or

¹ हातिंशदङ्गुलायतदग्नपरिनाहेन लौहदण्डे न ।
एनीपदेन कुर्यादुद्धरणं तयोः सम्यक् ॥
ब्रीहिसुखेन च परिशोध्य सर्वस्तस्य दलमूलेषु ।
उशोदकघौतेषु मधुसर्पिः पूरणं दद्यात् ॥

Pālakāpya, III. xviii.

² Paul. VI. xxviii.

³ Elphinstone's History of India, P. 365, 5th Ed.

⁴ विविधामेषणां विद्यामवौच्च कठिनामपि ।
उद्दिदैम् दुभिर्नालैलीहानां वा श्लाकया ॥
गम्भीरमांसगे देशे पार्श्वे लौहश्लाकया ।
एव्यं विद्याद् त्रयं नालैविपरीतमतो भिषक् ॥

Caraka Saṁhitā, VI. xiii.

metallic probes, and the soft probes such as the young stems of plants. The hard probes are required for deep sinuses in the fleshy parts and the sides of the body, while the softer varieties are used for probing the superficial sinuses¹. The ends of the probes are generally shaped like the head of the earth-worms². Suśruta³ describes them to be eight aṅguli long. They are to be used as probes to ascertain the direction of sinuses.³ The blunt probes have been described before under the śalākās.⁴

The sharp probes have the shape of a needle and are six aṅguli long. The other end carries an eye through which is put one end of a caustic thread (*i.e.*, thread soaked in caustic lotion and then dried). The probe is to be used for piercing the tissues through the blind end of the sinus. The end of the thread is next to be withdrawn from the eye of the probe and a tight knot applied with the other end. The intervening bridge of tissues is thus gradually cut and the sinus opened. If the cord be found inefficient for the purpose, a second thread is to be tied similarly.⁵

¹ एषणी गग्नुपदाकारमुखी ।

Suśruta Saṁhitā, I. viii.

² तत्र नस्त्रैष्यावस्थाहृले ।

Ibid.

³ गतेरन्तेषणे श्वक्षणा गग्नुपदमुखैषणी ।

Aṣṭāṅga Hṛidya Saṁhitā, I. xxvi.

एषाग्न्यव्युत्पन्नमाह गतेरित्यादि एषणीनाम शस्त्रं गतेः नाडीब्रणसा पूयादिपथस्य अन्तेषणे अन्वेच्छणे योज्यं । सा चैषनी श्वक्षणा कोमलस्पर्शी, तथा गग्नुपदमुखा, महीलता मुखाकार मुखा च भवति ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

⁴ See page 155-7.

⁵ क्षशट्टुर्ब्लभीरुणां नाडीमर्मश्रिताच या ।

चारमूत्रेण तां किन्द्याद्व तु शस्त्रेण दुक्षिमान् ॥

This method of treatment is recommended for the weak and timid patients. The needle-shaped probe is also to be used in the extirpation of new growths by means of caustic threads. Cakradatta¹ also describes this operation ; evidently he copies it from Suśruta. In the Yogaratnākara² the verses describing the operation are also quoted. Vāgbhaṭa also mentions a needle-shaped probe for the same purpose.³

In treating of fistula-in-ano, Paul quotes from Hippocrates and says⁴ :—“For Hippocrates directs us to pass a raw thread,

एषणा गतिमन्विष्य चारसूचानुसारिणीम् ।
सूचौ निदभ्याह्नत्यन्ते तथोन्नस्याशु निर्हरेत् ॥
मूत्रसगान्त् समानीय गाढवस्थं समाचरेत् ।
ततः चार वलं बौद्ध्यं सूवमन्यत् प्रवेशयेत् ॥
ज्ञाराक्तं मतिमान् वैद्यो यावन्नच्छियते गतिः ।
भगद्वरेऽप्येष विधिः कार्यः वैद्येन जानता ॥
अब्दुदादिसु चोत्तच्छिय मूले सूचं निधापयेत् ।
सूचौभिर्याववक्ताभिराचित् वाः समन्ततः ।
मूले सूचेण वध्नीयाच्छिन्ने चोपचरेद्वाणः ॥

Suśruta Saṃhitā, IV. xvii.

¹ These verses are quoted in the Cakradatta, Nādiṣvaraṇa Cikitsā.

² Also quoted in the Yogaratnākara, P. 346.

³ भेदनार्थैपरा सूचौसुखा मूलनिविष्टखा ।

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxvi.

अपरमयेषणी शस्त्रमाह । भेदनार्थै इत्यादि भेदनार्थै नाडीत्रणानां गतिभेदनर्थै अपरा पूर्वीकाया एषणा अन्या सूचौसुखा सूच्याकार सुखा सगात् तथा मूले मूलदेशे निविष्टं, सूवनिवेश योग्यं खं छिद्रं यस्याः सा मूलनिविष्टखा मञ्चिद्रमूलमित्यर्थः । अस्या एषणामूले छिद्रकरणं चारक्तमूत्रनिवन्धनार्थै । तेन प्रभिन्न इग्निक्षाशितेन दृढवस्थेन चारसूचेण नाडीत्रणः प्रकाश्यते ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

* Paul. VI lxxviii.

consisting of five pieees, through the fistula by means of a probe having a perforation, or a double headed speillum ; and to tie the ends of the thread and tighten it every day until the whole intermediate substance between the orifices be divided and the ligature fall out". Hippocrates¹ describes minutely the apolinose and recommends it for those who from timidity avoid a surgical operation. Celsus recommends the thread to be smeared with some escharotic ointment. The proeess, he says, is slow but free from pain². Albueasis³ also approves of the operation according to circumstances. The operation ealled apolinose *i.e.*, by the ligature, is very celebrated. Ambrose Pare, Foubert, Camper, Giudo de Cauliaco and Rogerius approve of the ligature. It has been recommended by some of the modern surgeons⁴. The operation is still praetised in India by the Madrasi specialists for fistula-in-ano.

Vāgbhaṭa⁵ describes copper probes having the sharp ends shaped like the bnd's of Kuravaka (Baleria Cristata) to be used in

¹ Hippocrates. 'De Fistulis'.

² Celsus. vii. 4.

³ Albucasis. Chirrug. ii. 80.

⁴ Laneet. vol. I. 1845, new series.

⁵ ताम्री श्लाका दिसुखा सुखे कुरवकाकृतिः ।

लिङ्ग नाशं तथा विष्येत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

श्लाका शस्त्रं अङ्गुलि शस्त्रवच्चाह ताम्रीत्यादि दिसुखा, दिङ्गारा, सुखे, सुखप्रदेशे कुरवका कृतिः, रक्तकिञ्चणीपुष्प मुकुलकारा, ताम्री, ताम्रमयी, श्लाका, श्लाका शस्त्रं सग्रात् । तथा श्लाकया लिङ्गनाशं, कफोत्थं पठल संज्ञकं चच्चुरोग विशेषं विष्येत् । विष्येदित्यन्ते न च्छेदः ।

Vagbhataṛtha Kaumūḍī I. xxvi.

the operation of eataraet. Suśruta¹ describes such a probe to be eight aṅguli long, made of copper, or iron, or gold, the ends being shaped like buds. A thread is spirally twisted round the middle of the instrument for a length of a thumb's breadth, to afford a firm grasp by the surgeon's fingers. This instrument must not be rough, thick or very sharp, for then there would be a greater chance of the eye being injured more than is necessary and at many places. So also in enucleating of eataraet, Celsus says: "Then a needle is to be applied, sharp so as to penetrate, but not too fine."²

Pālakāpya³ mentions eṣanī in the surgical treatment of diseases of the elephants. He describes three probes,—smooth and shaped like the ointment rods. They are recommended to be ten, twenty and thirty aṅguli long respectively.

¹ श्लाका कर्कशाश्वलं खरा दोषप्रिपुति ।
ब्रणं विशालं स्फुलाभा तीक्ष्णा हिंसादनेकधा ॥
जलास्थावन्तु विषमा क्रियासङ्गमयास्थिरा ।
करोति वर्जिता दोषैस्तस्मादभिर्हिता भवेत् ॥
अट्टाङ्गुलायता मध्ये सूखेण परिवेष्टिता ।
अङ्गुष्ठ पर्वसमिता वक्त्रयोर्मुकुला कृतिः ॥
ताम्बायसी शातकौम्भी श्लाका सगादनिन्दिता ।

Suśruta Saṃhitā, VI. xvii.

² Celsus. VII. viii.

³ स्थिरा मङ्गी च कर्त्तव्या त्रणानामेषणी भवेत् ।
हृत्ता गण्डपदसुखी प्रमाणी विंशदङ्गुली ॥
सुवर्णरुद्धतामाणामायसी गृहङ्गजायपि वा ।
दन्तास्थिवेनुदारुणामेषणी दारुणा भवेत् ॥

Pālakāpya, III. i.

एषणी दग्धाङ्गुला विंशत्यङ्गुला विंशदङ्गुला यथायोगमञ्जनश्लाकाकृति सुखतः श्वक्षणा ससा
चैवमेतास्त्रिस एषणः प्रमाणतः कार्याः ।

Ibid, III. xxx.

The operation of couching for cataract is essentially an Indian operation; and Suśruta describes the operation minutely as follows :—

The operation of couching for cataract.

Suśruta says¹ : “Now we shall describe the treatment of cataract caused by phlegm. If inside the crystalline lens, anything is seen like a half-moon-shaped drop of water or pearl, hard, irregular

४ श्वैमिके लिङ्गनाशे तु कर्म वच्चामि सिङ्गये ।
नचेदद्वैन्दुघर्षाम्बुविन्दुमुक्ताकृतिः स्थिरः ॥
विषमो वा तनुभ्रष्टे राजिमान्वा वहप्रभः ।
दृष्टिस्थो लक्षणे दोषः सरजा वा सुलोहितः ॥
सिंधस्त्रिवसा तसाय काले नात्युष्णशीतले ।
यन्त्रितस्थोपविष्टसा खानासां पश्यतः सम् ॥
मतिमान् शुक्रभागौ द्वौ क्षणाम्बुद्धाह्यपाङ्गतः ।
उन्नोल्य नयने सम्यक् शिराजाल विवर्जिते ॥
नाधो नोईच्च पार्श्वाभ्यां क्षिंदे देवकते ततः ।
शलाकया प्रथदेन विश्वस्त् यववक्रया ॥
मध्य प्रदेशिन्द्रियस्थिरहस्त गृहीतया ।
दक्षिणेन भिषक् सन्य विष्येत् सन्येन चेतरत् ॥
वारिविन्दागमः सम्यक् भवेच्छद्वस्था व्यधे ।
संसिद्ध विज्ञमावन्तु योषितस्त्वयेन कोविदः ॥
स्थिरे दोषे चले वापि खे दयेदचि वाह्यतः ।
सम्यक् शलाकां संस्थाप्यहौर निलानाशनैः ॥
शलाकायेण तु ततो निर्जिखेद्विष्टमण्डलं ।
विष्यतो योऽन्य पाश्वैक्षण्स् रुद्धा नासिकापुटं ॥
उच्छिङ्गनेन हत्तैऽयो उष्टिमन्डलजः कफः ।
निरभ इव घर्षांशुर्यदा उष्टिः प्रकाशते ॥
तदासौ लिखिता सम्यग् ज्ञेया याचापि निर्वया ।
ततो इष्टेषु रूपेषु शलाकामाहरेच्छनैः ॥

or thin, striated or shinning, painful or red, caused by the deranged humours, the oleaginous applications and fomentations are to be tried first at a time when it is neither hot nor cold; then he (patient) is to be ligatured after having him seated conveniently, and should be directed to look towards his own nose. The intelligent (surgeon), then separating the white part from the black part and the external eanths of the eye after opening it, avoiding the vascular network, and leaving the parts above and below intact, is to pass a yavamukhī śalākā (or sharp needle having its end resembling a wheat) through a natural opening on the side, steadily holding the rod with the thumb, index and middle fingers. If the operation be required on the right eye, the left hand, and if on the left eye, the right hand of the surgeon should use the needle in puncturing. A successful puncture is known by the escape of a drop of fluid and an audible sound. The experienced surgeon is to sprinkle woman's milk just after the puncture, and keeping the needle there, whether the deranged humour be movable or not, should apply fomentations externally by means of oily remedies for the deranged air. The crystalline lens is next to be scarified by the sharp end of the needle. Then keeping the needle fixed in the side of the eye, the patient should be directed to sniff so as to destroy the phlegm of the lens. The proper scarification will be indicated when the lens appears brilliant as the sun unobscured by clouds. Then the vision being clear, the needle in the side of the eye, is to be removed; and the eye is to be well

ष्टेनाभ्यज्य नयनं पस्त्रपद्मे वैष्टयेत् ।

ततो एहे निरावधि श्यीतोन्नान एव च ॥

soaked with ghee (melted butter) and bandaged properly.” Vāgbhaṭa also describes the operation similarly.¹

To this we may compare the account of the operation as given by Celsus. He “lays it down as a rule, that when the suffusion is small, immovable, and of the colour of sea water, or of shinning iron, and if a small degree of light can be perceived at the side, there is reason to hope well of the ease. He forbids us to operate until the disease has attained a proper consistence. He directs us to place the patient opposite the operator, who is to sit on a higher seat, while the patient’s head

¹ अथ साधारणे काले गुद्दसंभोजितात्मनः ।
देशे प्रकाशे पूर्वाल्ले भिषग् जानुच्च पौडगः ॥
यान्त्रितस्योपविष्टस्य स्तिनाच्चसर मुखानिलैः ।
अङ्गुष्ठ स्फुटे नेत्रे दृष्टौ दृष्टेत्प्रतं मलम् ॥
खनासां प्रे चमाणस्य निक्षयं सुप्रिं धारिति ।
कृष्णादर्ढाङ्गुलं सुक्रा तदर्ढार्डमपाङ्गतः ॥
तर्जनीमध्यमाङ्गुष्ठैः शलाका नियतं ध्रुताम् ।
दैवच्छिद्रं नयेत् पाश्चादर्ढमामस्ययन्निव ॥
सत्यं दच्चिणहस्तेन नेत्रं सत्येन चेतरत् ।
विष्टेत् सुविष्टे शब्दः स्यादरुक चाम्बुलवसुतिः ॥
सान्त्वयन्नातुरं चानु नेत्रं सत्येन सेचयेत् ।
शलाकायास्तोऽग्रेण निर्लिखेन्नेत्रमग्ङलं ॥
अवाधमानः शनकैर्नासां प्रतिनुदंस्तः ।
उच्छिच्छनाच्चापहरेइ दृष्टिमण्डलं कफम् ।
स्थिरे दोषे चले चापि स्वे दयेदच्चिवाह्यतः ॥
अथ दृष्टेषु रूपेषु शलाकामाहरेच्छनैः ।
घृताङ्गुलं पितॄदत्त्वा वज्ञाकं शाययेत्ततः ॥
विज्ञादन्येन पार्श्वेन तमुचानं इयोर्यैषे ।
निवाते शयनेऽभ्यक्तश्चिरः पादं हितेरतम् ॥

is held by an assistant. The sound eye is to be previously covered up with wool. If the left eye is affected, the operator must use his right hand, and *vice versa*. A needle which is sharp and not too slender is to be passed direct through the two coats at a place intermediate between the temporal angle and the black of the eye, and towards the middle of the cataract. When the needle has perforated far enough, which is readily known by the absence of resistance, it is to be turned so as gradually to remove the cataract below the region of the pupil and this object being attained it is to be strongly pressed to the lower part. If it remain there the operation is completed, but if it return, it is to be cut and torn by the needle into many pieces, in which state they are easier depressed, and prove less troublesome. The needle is then to be drawn out direct and soft wool smeared with white of an egg, and other anti-inflammatory applications are to be used. Quiet, restricted diet, and soothing treatment will be proper.¹" Paul², Mesue³, Albucasis⁴, Rhazes⁵ and others also describe the operation ofouching in similar terms. Albucasis gives figures of these needles.

The operation is still practised in India by the māls who consider themselves specialists in diseases of the eyes.

21. SARPĀSYA.

Vāgbhaṭa describes an instrument having its end resembling

¹ Celsus. vi. See Adam's Commentary to Paul VI. xxi.

² Paul. VI. xxi.

³ Mesue. De Agr. oculi, 15.

⁴ Albucasis. Chirrug, II. 23.

⁵ Rhazes. Ad mansor.

the mouth of a snake ¹. The blade is said to be half an anguli long. It is advised to be used for excision of the nasal and aural polypi.

The fact that it was able to work inside the nose and the auditory canal shows that it could not have been of any great breadth, possibly less than a quarter of an inch at the most. The exact shape of the sarpāsyā can not be determined with certainty. The Greeks however used for the same purpose, "a polypus scalpel, having its extremity shaped like a myrtle leaf," which was a double instrument, the other end being a scoop ².

GOLD OR SILVER KNIFE.

To cut the navel cord, Caraka ³ recommends the use of a knife, made of gold, or silver, or iron. To make gold and silver knives of sharp edges seems absonous to our reason, but we must remember that to cut the navel cord, a very keen edge is not required, and even now the purpose is often served by the native dhāis with a piece of split bamboo.

¹ सर्पास्र व्राणकर्णीश्चेदनेऽद्वाङ्गुलं फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

सर्पास्यं नाम शस्त्रमाह । सर्पास्यं इत्यादि सपाथं नाम शस्त्रं नासिका कर्णीश्चसां क्षेदने योज्यं तत्र फले अङ्गुलार्डपरिमितं अङ्गुलपरिमित फलकमित्यर्थः । अस्रं सर्पेसुखसङ्घश मुखत्वात् सर्पास्रमिति संज्ञा ।

Vāgbhaṭārtha Kaumūdī. I. xxvi.

² Paul. VI. xxv.

³ See foot-note 4. P. 65.

PRATUDA.

Suśruta mentions it as a knife to be used for making scarifications on the body of a lunatic.¹

The mode of holding the sharp instruments.

Suśruta says² : “The vr̥ddhipatra is to be held at the junction of the handle and the blade; and all instruments used for incision should be held similarly. The vr̥ddhipatra and maṇḍalāgra, if used for scarification, should be held with the hand raised a little; when used for evacuating abscesses, they, as well as all other instruments, should be held by the fore part of the handle. But in the case of children, old or delicate or timid persons, women, and kings and prinees, abscesses should be evacuated with the trikūrcaka. The vr̥himukha is to be held with the thumb and forefinger, its handle being covered within the palm. The kuṭhārikā is to be held in position with the left hand, and struck with the middle finger when let go forcibly from the under surface of the thumb of the right hand. The ārā, karapatra and eṣanī should be held at their extremities.

¹ प्रतुदैर्दरयेत् चैन् मर्मघातं विवर्जयेत् ।
मर्पिंधाने जरतङ्गपे सततं वा निवासयेत् ॥

Suśruta Saṁhitā, VI. liii.

² तेषामययोग यहण समासोपायः कर्मसु वत्यते । तत्र छडिपत्रं डलफलसाधारणे भागे गट्टीयाङ्गेदनान्येवं सर्वाणि । छडिपत्रं मण्डलायन्नं किञ्चिदुत्तानपाणिना लेखने वहशोऽवचार्यं डलागे विस्तावणानि । विशेषेण वालवङ्गमुकुमार भीरु नामीणां राजां राजपुत्राणान्नं विकूर्चकेन विस्तावयेत् । तल प्रच्छादित वलमङ्गुष्ठ प्रदेशिनीभ्यां ब्रीहिसुखं । कुठारिकां वामहस्तन्यस्तामित-रहस्त मध्यमाङ्गुल्याङ्गुष्ठ विष्ठव्याभिहन्यात् । आराकरपवैषग्यो मूले । शेषाणि तु यथायोगं गट्टीयात् ।

Suśruta Saṁhitā, I. viii.

The other instruments are to be held as required in particular cases.” Vāgbhata also gives similar directions ¹.

The practical training in surgical operations.

Suśruta says ²: “Even after a pupil has mastered the whole of the medical treatises, the preceptor should instruct him practically how to perform surgical operations and how to administer oils and other medicines. However learned he may be in books, he cannot be fit for surgical practice, unless he has acquired the practical training. Therefore the preceptor should show his pupils the methods of operations, of incision, excision and division, upwards and downwards on the pumpkin, bottle-gourds, water-melons, and the three varieties of cucumbers—Trapusa (Cucumis Sativus), Ervārūka (Cucumis Utilissimus), and Karkarūka (Cucumis Melo).

¹ क्षेद भैदेन लिख्यार्थं ग्रस्तं वृन्त फलान्तरे ।
तर्जनी मध्याङ्गुष्ठेर्गत्त्वीथात् सुसमाहितः ।
विसावणादि बन्ताप्ये तर्जन्यङ्गुष्ठके न च ।
तल प्रकृत्वा बन्ताग्यं यात्त्वा ब्रौहिमुखं सुखे ।
मूलेष्वाहरणार्थानि क्रिया सौकर्यतोऽपरं ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

² अधिगत सर्वशस्त्रार्थमपि शिष्यं योग्याङ्गारयेत् । क्षेयादिषु स्तेहादिषु च कर्मपथसुप-
दिशेत् । सुवहश्चुतोप्यक्तत योग्यः कर्मस्ययोग्यो भवति । तत्र पुष्टफलालाभू कालिन्दक-
तपुष्टव्यारुककर्कारुक प्रभृतिषु क्षेय विशेषान् दर्शयेदुत्कर्त्तनपरिकर्त्तनानि चोपदिशेत् ।
टृति वस्त्र प्रसेवक प्रभृतिषूदकपङ्क पूर्णेषु भेद्य योग्यां । सरोन्मि चर्माणातते लिख्यस्य ।
मृत पशुसिरास्तपलनालिषुच वेध्यस्य । घुणोपहत काष्ठवेण नलनालीयुक्तालाभूसुखिष्वे ष्यस्य ।
पनश्विम्बौविल्वफलमज्जमृतपशुदन्तेष्वाहार्थस्य । मधूच्छिष्टोपलिमि शाब्दलीफलके विसाव्यस्य ।
मूच्छघनवस्त्रान्तयोर्मृदुचर्मान्तयोश्च सौव्यसरा । पुस्तमय पुरुषाङ्गप्रत्यङ्ग विशेषेषु वन्धयोग्यां ।
मृदुमांसपेशीषूतपलनालेषु च कर्णसम्भिवस्थयोग्यां । मृदुषु मांसखण्डेष्वग्निचारयोग्यां । उदक
पूर्णघटपार्श्वं स्त्रोतस्यलाभूमुखादिषु च नेत्रप्रणिधानवस्त्रिव्रण वस्त्र पीड़न योग्यामिति ।

Suśruta Saṁhitā. I. ix.

The operation of puncturing or tapping may be demonstrated on leather bags, bladders and pouches, filled with slush; scarifications, on stretched pieces of leather covered with hair; opening on the veins of dead animals or on stalks of water-lily; probing on worm-eaten wood, bamboo, reed, tube or dried bottle-gourd; extraction, on the pulp of jack fruit, the Bael fruit (*Ægle Marmelos*), Vimbi fruit (*Cephalandra Indica*) or on the teeth of dead animals. Evacuation on a lump of wax applied to a board of Sālmali wood (*Bombax Malabaricum*); sewing, on the two ends of a thick piece of cloth or soft leather; bandaging on the limbs of a dummy (human figure made of cloth and clay), bandaging the root of the ear, on a piece of soft flesh, or the stalk of a water-lily; application of cauteries, on pieces of flesh; introduction of tubes for enemas (urethral, rectal and vaginal) and wound-syringe, on the spout of an earthen vessel filled with water, or on the mouth of a bottle-gourd or similar objects."

CHAPTER VII.

THE ANUŚASTRA.

The anuśastra means substitutes for cutting instruments. They are the following¹ :—

1. Bamboo. 2. crystal. 3. glass. 4. ruby. 5. leeches. 6. fire.
7. caustics. 8. the nails. 9, leaves of Goji (Elephantobus Seaber), 10. Šephālikā (Nyctanthe Arbortristis), and 11. Šākhā (Tectona Grandis). 12. young stems of plants. 13. hair
14. finger.

These are advised to be used in case of infants or timid persons or when the proper instruments are not available.²

1. BAMBOO.

A piece of split bamboo is said to have been used for cutting through and cutting into some parts of the body. It is still used by the native dhāis or midwives for cutting the funis.

A piece of baniboo is directed to be used for applying pressure on small boils to cure them by subsidence³. For the same purpose, the pressure of the thumb is also recommended⁴.

¹ अनुशस्त्राणि तु लक्षसारस्फटिककाचकुरविन्दजलौकाग्रिक्षारनखगोजीशेफालिकाशाकपत्र करीरवालाङ्गुलय इति ।

Suśruta Samhitā. I. viii.

² शिशुनां शस्त्रभीरुणां शस्त्राभावे च योजयेत् ।

लक्षसारादि चतुर्वर्गं क्षेये भेद्ये च बुद्धिमान् ॥

Ibid.

³ हृतेषु दोषेषु यथानुपूर्वं गन्धौ भिषक् स्त्रे प्र समुत्थिते तु ॥

स्त्रिनस्य विस्त्रापनमेव कुर्यादङ्गुष्ठलोहोपलवेण दण्डैः ।

Ibid. IV. xviii.

⁴ अभ्यन्त्र स्त्रेदयित्वा च वेणुनाद्वा ततः शनैः ।

विस्त्रापनार्थं स्त्रीयात् तस्मेनाङ्गुष्ठकेन वा ॥

Cakradatta, Vraṇasothā Cikitsā.

Bamboo is also mentioned to have supplied largely the materials of splints for treatment of fractures and dislocations. For this purpose it is to be split into thin layers¹. Split bamboo is still used for the treatment of fractures by the kavirājēs and might advantageously be used by the modern surgeons as a cheap and easily available material for splint.

Dissection.

It is generally supposed that the practice of dissection of the human body for anatomical studies was unknown to the ancients. But the practice of human dissection is unmistakably referred to in the Suśruta Saṁhitā.² Brushes made of bamboo, barks of trees, grass roots, and hairs are mentioned as instruments of dissection. "Thus a body should be secured which is complete in all the parts and which is of a person who was not more than 100 years old, nor who died from the effects of poison or of a chronic disease. Having cleared the intestines of any faecal matter, the body should be well wrapped either in Muñja (Saccharum Munja), or grass, or barks of trees or hemp etc., put inside a cage which should be firmly fastened, in a solitary spot, in a calm river and thus allowed to decompose. After seven nights, having taken out

¹ विभग्नं नरं दृशा वेणुखण्डे न वस्येत् ।

सुक्षयैन्नवनीतनैररण्डपत्रश्च वैष्टयेत् ॥

Hārita Saṁhitā, II.I lvi.

² तमात् समस्तगात्रमविपोपहतमदीर्घं व्याधिपौडितमवर्धशतिक' निःस्फटाल्पुरीष' पुरुषम-
वहन्यामापगायां निवङ्ग' पञ्चरस्य' मुञ्जवल्कलकुशशशादीनामन्यतमेनावेष्टिताङ्गमप्रकाशे देशे
कोथयेत् सम्यक् प्रकृयितचोऽन्त्य ततो देह' सप्तरात्रादुशीर वालवेणु वल्कल कृचीनामन्यतमेन
भनैः शनैरवर्धय' स्वगादीन् सर्वानेव वाह्नाभ्यन्तराङ्गप्रत्यङ्ग विशेषान् यथोक्तान् लक्षयेच्चतुषा ।

Suśruta Saṁhitā, III. v.

the thoroughly decomposed body, it should be slowly rubbed with a brush made either of *Uṣīra* (*Andropagon Murieatus*) or hair, or bamboo, or barks of trees, examining at the same time with the eyes, every division and sub-division of the body, external or internal, beginning with the skin, as delineated in the *śāstras*." Animal anatomy was also thoroughly understood as each part of the body had its own distinctive name.

Hoernle¹ says : "Probably it will come as a surprise to many as it did to myself, to discover the amount of anatomical knowledge which is disclosed in the works of the earliest medical writers of India. Its extent and accuracy are surprising, when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition.*** Of the practice of such dissection in ancient India we have direct proof in the medical compendium of *Suśruta*, and it is indirectly confirmed by the statements of *Caraka*. It is worthy of note, however, that in the writings of neither of these two oldest Indian medical writers is there any indication of the practice of animal dissection."

The Greeks did not practise dissection of the human body. "The anatomical knowledge of the Hippoeratists was derived chiefly from dismemberment of animals, experience in slaughtering and sacrifices, and from the observation of surgical cases. Systematic dissection of the human body was out of the question owing to the religious precepts which strictly enjoined immediate burial, and to the superstitious horror of the dead which then prevailed. The supposition that outstanding individual investigators, upon rare occasions, did not hesitate to examine

¹ Hoernle. Osteology. Preface. iii.

human bodies or parts of bodies (particularly) bones, in order to correct prevailing opinions, is one which, if not susceptible of direct proof, is at least probable. This supposition, besides being borne out by many statements on the part of ancient writers, is the more probable since the bodies of savages, traitors and criminals were outside the pale of religious ordinances and were therefore available, as were also accidentally obtained portions of the body, to satisfy the curiosity of scientific investigators. No one of the oft-quoted extracts from the Hippocratic writings, supposed by individual historians to refer to human dissection, is quite conclusive, whilst nowhere is there in the pathology of the day any definite trace of anatomical research upon the bodies of those dead of disease. On the other hand comparisons are frequently instituted by the Hippocratists referring to facts acquired through zootomy or to anatomico-pathological discoveries such as might have been made in the slaughtering of beasts.”¹

The study of anatomy received its impetus from the Alexandrian School. “Herophilus improved the technique and developed the terminology of anatomy and enriched it by valuable discoveries made in the dissection of human bodies, particularly in the knowledge of nerves, vessels and viscera, but also in that of the eye. With his works, systematic anatomical investigation may in fact be said to begin.”²

“Like Herophilus, Erasistratos made a successful study of anatomy, even surpassing the former in knowledge of details, and in a series of observations upon the cadavers of men and

¹ History of Medicine. Neuberger. P. 150.

² Ibid. P. 177-8.

animals, corrected his own mistakes as well as those of others. His greatest achievement was in the study of nerves and vessels.”¹

2, 3 AND 4. CRYSTAL, GLASS AND RUBY.

These are recommended to be used for cutting through and cutting into some parts of the body.

Glass vessels for preparing medicines are often mentioned. Śāringadhara² used it for purifying mercury.

5. LEECHES.

Leeches are described to be the mildest of all means for extracting blood, and are recommended for princes, children, women, and timid people³.

Twelve kinds of leeches are described⁴; six of them are poisonous and six, non-poisonous.

¹ History of Medicine. Neuberger. P. 181.

² काचकूप्यां विनिक्षिप्य ताञ्च मृदस्वसुद्रया ।

विलिप्य परितो वक्रं मूद्रां दत्त्वा च शौषधेत् ॥

Śāringadhara Saṅgraha, II. xii.

³ वृपा श्वालस्थविर भौरदुर्बलनारी सुकुभाराणमनुग्रहार्थं परमसुकुभारोऽयं शोणितावसे च नोपायोऽभिहितो जलौकसः ॥

Suśruta Saṅhitā, I. xiii.

⁴ जलमासामायुरिति जलायुका जनमासामोक इति जलौकसः । ता वादश तासां सविधाः पट् तावद्य एव निर्विषाः । तब सविधाः क्लेणा कर्व्युरा अलगाद्वां इन्द्रायुधा सामुद्रिका गोचन्दना चेति । ताम्बज्जनन्वर्णवर्णा पृथुशिराः क्लेणा । वर्मिमत्स्यवदायता क्षिन्नोन्नत-कुचिः कर्व्युरा । रोमशा महापार्श्वा क्लेणसुख्यलगद्वा । इन्द्रायुधवद्वाराजिभिश्चिविता इन्द्रायुधा । ईषदसितपीतिका विचिव पुष्पाकृतिचित्रा सामुद्रिका । गोहृष्णवदधोभागी हिधाभूताक्लितरणुसुख्वी गोचन्दनेति । ताभिर्द्वैषे पुरुषे दंशे श्वश्यथुरतिमात् कण्ठूमूर्च्छा

The poisonous leeches are :—

1. Kṛṣṇāḥ :—it is of the colour of black eollyrium and has a broad head.

ज्वरोदाहश्कृद्धिर्भदः सदनमितिलिङ्गानि भवन्ति । तत्र महागदः पानासेपननसर कर्मादियुप-
योज्यः । इन्द्रायुधादसमसाध्यमित्येताः सविषाः सचिकित्सिता व्याख्याताः । अथ निर्विषाः ।
कपिला पिङ्गला शङ्खसुखी मूषिका पुण्डरीकसुखी सावरिकाच्चिति । तत्र मनःशिलारञ्जिता-
भ्यासित पार्श्वाभ्यां पृष्ठे स्निग्धसुद्धवर्णा कपिला । किञ्चिद्रक्ता ब्रतकाया पिङ्गाशुगुणाच पिङ्गला ।
यक्षद्वर्णा शैवप्रायिनी दीर्घतीक्ष्णसुखी शङ्खसुखी । मूषिकाकृति वर्णाऽनिष्टगम्भा च मूषिका ।
सुद्धवर्णा पुण्डरीकतुल्यवक्ता पुण्डरीकसुखी । श्रिग्धा पद्मपववर्णाऽदशाङ्गुलप्रसाणा सावरिका
साच पञ्चर्थे । इत्येता अविषा व्याख्याताः ।

तासां प्रयहणमार्द्वचर्मणान्वैर्वा प्रयोगेर्गं हीयात् । अद्यैनां नवे महति घटे सरसाङ्ग-
गोदकपङ्गमावाप्य निदध्यात् । भव्यार्थे चासामूपहरैच्छेवलं बङ्गरमौदकांश्च कलदां-
शूर्णीकृत्य शव्यार्थं हणमौदकानि च पदाणि । हयहान्त्रहान्त्रान्यन्त्रलं भव्यच्च दद्यात् ।
सप्तरात् सप्तरात् वटमन्यं संक्रामयेत् । भवति चात्र ।

स्थूलमध्याः परिक्लिष्टाः पृथ्यो मन्दविचेष्टिः ।

अग्राहिण्योऽल्पपायिन्यः सविषाश्च न पूजिताः ॥

अथ जलौकोऽवसेकसाध्यव्याधितसुपवेश्य संवेश्य वा विरुद्ध्य चास्य तमवकाशं सङ्ग्रहेभय-
चूर्णेयव्यरुजः सप्तात् । गृहीताश्च ताः सर्षपरजनौकल्पोदक प्रदिग्धगावीः सलिलसरकमध्ये
सुहर्त्स्थिताविगतक्लमा ज्ञात्वा ताभीरोगं ग्राहयेत् । सूक्तमशुक्लार्द्वपिचुप्तोतावच्छन्नां क्लत्वा
सुखमपावण्यादग्न्त्वा चौरविन्दुं शोणितविन्दुं वा दद्याच्छस्त्रपदानि वा कुर्वीत यदेवमपि न
गृह्णोयात्तदान्यं ग्राहयेत् । यदा च निविश्टेऽश्वमुरवदानन् क्लत्वोन्नम्य च स्वन्धं तदा
जानीयाद गृह्णातीति गृह्णन्ती चार्द्ववस्त्रावच्छन्नां धारयेत् सेचयेच्च । दंशे तोदकन्तुप्रादुभां-
वैज्ञानीयाच्छुद्भियमादत्त इति शुद्धमाददानामपनयेत् । अथ शोणितगम्भेन न सुच्छेन्सुखमस्या:
सैम्बवचूर्णनावकिरेत् । अथ पतितां तण्डुलकण्डुलप्रदिग्धगावीं तैललवणाभ्यक्तसुखीं वाम-
हस्ताङ्गुष्ठाङ्गुलीभ्यां गृहीतपुच्छां दक्षिणहस्ताङ्गुष्ठाङ्गुलीभ्यां शैनैः शैनैरनुलोभमनुमार्जयेदा-
सुखादामयेत्तावद्यावत् सम्बवान्तलिङ्गानीति । सम्बवान्ता सलिलसरकम्ब्यस्ता भोक्तुकामा सती
चरेत् । या सौदति न चेष्टते सा दुर्बाला तां पुनः सम्बवामयेत् । दुर्बालाया व्याधिर-
साध्यइन्द्रमदो नाम भवति । अथ सुवन्तां पूर्ववत् सन्निदध्यात् शोणितसर क्षीयेवधीत वा ब्रणं काषाय मधुर स्निग्धशीतैश्च
प्रदेहैः प्रदित्यादिति ।

2. Karvūrā :—it is as long as an eel with elevated stripes across the abdomen.

3. Alagarddā :—it looks as if covered with hair and has large sides and black mouths.

4. Indrāyudhā :—or rain-bow coloured; it has rain-bow coloured longitudinal stripes on the back.

5. Sāmudrikā :—it is of dark yellow colour and has variegated flower like spots on its body.

6. Goeandanā :—it has a bifurcated tail like the scrotum of a bull and a small mouth.

The non-poisonous ones are—

1. Kapilā or the greenish one ;—it has its two sides of the colour of orpiment, and on its back, it is smooth and of the colour of a green pea.

2. Piṅgalā or twany ;—it is of a reddish-brown colour, has a round body and moves quickly.

3. Saṅku-mukhī or bluish-red ;—it is of the colour of the liver, sucks quickly and has a long sharp mouth.

4. Mūṣikā or rat-like ;—it has the shape and colour of a rat's tail and emits a disagreeable smell.

5. Pundarika-mukhi or lotus-faced ;—it is of the colour of a green pea and has a mouth like a lotus.

6. Savarikā ;—it is slimy, coloured green like a lotus-leaf and eight angulū long; it is to be used in veterinary practice.

The non-poisonous leeches generally live in meadows and fresh water. They are to be caught with a piece of wet leather and

kept in a new large earthen pot filled with mud, water, green fungi, dry flesh, etc. The water is to be changed every third day and the pot every seventh day.

To apply leeches, the patient is directed to lie down and the part is to be rubbed dry with powdered cow dung and earth. The leech is then to be smeared with a paste containing turmeric, mustard and water, to excite them, washed thoroughly with water and then applied, its body being covered with a piece of wet cloth. To fix it quickly, a drop of milk or blood is to be applied over the diseased part, searification of which is also recommended instead. When the leech has removed the necessary quantity of blood, a small quantity of salt is advised to be sprinkled upon its head to make it drop off. Then the leech is to be put upon some powdered rice and its mouth is advised to be smeared with oil and salt.

Then it is to be stripped and put in fresh water, and should be used again, if it moves, but if languid, thrown away.

The leech-bites are to be smeared with honey, cold water and astringent substances, or poulticed.

Vāgbhata also gives similar directions for the application of leeches.¹

¹ जनौकसन्तु मुखिनां रक्तस्रावाय योजयेत् ।
दुष्टाम्बुमत्स्रा भेकाहि श्वकीयमलोङ्गवाः ।
रक्ताः श्वेता भृशं कृष्णाश्चपलाः स्थूलपिच्छिलाः ॥
इन्द्रायुधविचिदोऽुराजयो रोमशाश्व ताः ।
सविषा वर्जयेत्ताभिः कण्डुपाक ज्वरभसाः ॥
विप्रपित्तास्वनुत् कार्यं तत्र शुद्धाम्बुजाः पुनः ।
निर्विषाः श्वेतश्यावा ब्रह्मा नीलईराजयः ॥

Dr. Ray has clearly shown that “the discription of leeches as given by Rhazes agrees almost word for word with that of Suśruta (Sanasrad) in many places”. He describes the parallelism at length and comes to the conclusion “of the use of a chapter of the Susruta or some such work¹”.

6 AND 7. FIRE AND CAUSTICS.

The use of cauteries in surgery has been described before under the head of the accessory blunt instruments².

कृषाय पृथिव्यस्तन्दः किञ्चित् पोतदराश्य याः ॥
 ता अप्यसम्यग् वमनात् प्रततन्न निपातनात् ।
 सौदल्लौः सलिलं प्राप्य रक्तमत्ता इति व्यजेत् ॥
 अयेतरा निशाकल्प युक्ते उभसि परिप्रुताः ।
 अवन्लिमोमे तक्रेवा पुनश्चाशासिता जले ॥
 लागयेद् घृतमृतस्ताङ्ग शस्त्र रक्त निपातनैः ।
 पिबल्लीरुव्रहत् स्त्रांश्चाद्येन्मुद्रुवाससा ॥
 संपृत्ताङ्गुष्ट शुद्धास्त्राज्जलौका दुष्टशोणितम् ।
 आदत्ते प्रथमं हंसः चौरं चौरोदकादिव ॥
 दंशस्य तोदे कण्ठां वा मोक्षयेहामयेच ताम् ।
 पटुतैलाक्तवदनां श्वच्छ कण्ठेन रुक्षिताम् ॥
 रक्तन् रक्तमदाद भुयः सप्ताहं वा न पातयेत् ।
 पूर्ववत् पटुता दाह्यं सम्यग् वान्ते जलोकसाम् ।
 क्लोइतियोगाम्भ्युर्वा दुर्बल्ले स्त्रवता मदः ॥
 अन्यतान्यत ताः स्थाप्या घटे सृत्साम्बुर्गर्भिनि ।
 लालादिकोथ नाशार्थं सविषाः सुखदन्वयात् ॥
 अगुद्वौ स्वावयेदंशान् हरिद्रा गुडमाचिकेः ।
 शतधौताज्यपिचवस्ततो लेपाश्य शीतलाः ॥

Aṣṭāṅga Ḥṛdaya Saṁhitā, I. xxvi.

¹ History of Hindu Chemistry, Introduction P. lxviii,

² See Page 213-9.

8 AND 14. FINGERS AND NAILS.

The uses of surgeon's fingers and nails in surgical operations has been described before¹.

9,10 AND 11. LEAVES.

Rough leaves such as those of Fig trees (*Ficus Indicus*), Goji (*Elephantopus Seaber*), *Sephālikā* (*Nyetanthes Arbor-tristis*) and *Saka* (*Tectonia Grandis*) are recommended for scarifying abscesses if they do not heal up after repeated opening by the knife. If there is any formation of pus in the mouth or eyelids, it may be evacuated with these leaves (*Susruta*)². These leaves are also to be used for bleeding the gums in gingivitis.

To cover the wounds, Suśruta gives a list of leaves to be used according to the nature of the wound and season of the year³ :—

For air-disordered wounds ;—use leaves of *Eraṇḍa* (*Ricinus Communis*), *Bhūrjapatra* (*Betula Bhojpatra*), *Pūtika* (*Caesalpinia Bonducella*) and *Haridrā* (*Curcuma Longa*).

¹ See Page 199–202, and 204–5.

² संगीच्छोभयतः कार्यं शिरस्योप कुशे तथा ।
काकोडुर्बरिका गोजीपवेविसावयेदमृक् ॥

Suśrutā Samhitā, IV. xxii.

³ एरण्ड भूज्जपूतीक हरिद्राणान्तु वातजे ।
पञ्चमाश्ववल्ल यज्ञ कामरी पतमेव च ॥
पत्राणि क्षीरहन्त्राणामौदकानि तथेव च ।
दूषिते रक्तपित्ताण्यां ब्रणे दथाद्विचक्षणः ॥
पाठामूर्वागुडृचीनां काकमाचीहरिद्रयोः ।
पवच्च शुक्नाशाया योजयेत् कफजे ब्रणे ॥

Ibid, IV. i.

For bile or blood-deranged wounds;—use leaves of Āsvabala (Basella Rubra), Kāśmarīpatra, (Gmelina Arborea), Vata (Ficus Bengalensis) and Kumuda (Nymphae Lotus).

For phlegm-deranged wounds—use leaves of Pāṭhā (Cissampelos Hexandra), Mūrvā (Sansevieria Zeylanica), Guḍueū (Tinospora Cordifolia), Kākamācī (Solanum Nigrum), Haridrā (Curcuma Longa) and Śuknāśā (Oroxylum Indieum).

For similar purpose Caraka¹ recommends us to use the leaves of Kadamva (Anthocephalus Cadamba), Arjuna (Terminalia Arjuna), Nimva (Azadirachta Indiea), Pātalī, Pippala (Ficus Religiosa) and Arka (Calotropis Gigantea).

The leaves of the padma or nymphæ are to be used for handling the eyeballs and the intestines, to replace them in their proper position when prolapsed by injury² (Suśruta) Caraka recommends lotus leaves and plantain leaves as coverings to the bleeding piles,³ Cakradatta⁴ mentions the use of

¹ कदम्बार्जुननिम्बानां पाटल्याः पिप्पलसरा च ।

त्रश्च प्राच्छादने विडान् पवाण्यक्षसा चादिश्चेत् ॥

Caraka Saṁhitā, VI. xiii.

² भिन्नं नेव सकर्मण्यमभिन्नं लम्बते तु यत् ।

तन्निवेश्य यथास्थानमव्याविङ्गिरं शनैः ।

पीडयेत् पाणिना सन्ध्यक् पञ्चपवान्तरेण तु ॥

Suśruta Saṁhitā, IV. ii.

³ कदलीदलेरभिनवैः पुष्करं पवैश्च श्रीतजलसिन्तौः ।

प्रच्छादनं सुहम्मुहुरिं पञ्चोत्पलदलैश्च ॥

Caraka Saṁhitā, VI. ix.

⁴ गोजीशेकालिका पवैरर्गः संलिख्य लिपयेत् ।

चारेण वाक्शतं तिष्ठेद् यत्तद्वारं पिधाय च ॥

Cakradatta, Arśa Cikitsā.

Gojī and Šephālikā leaves for scratching the piles before the application of caustics to them. He also directs us to rub the small tumours with the rough leaves before the application of various ointments.¹ Šivodāsa also mentions the use of such leaves for rubbing the eyelids in the pillva disease.² Suśruta³ mentions the use of rough leaves for seratehing any part.

Paul⁴ mentions the use of fig leaves, for rubbing down the hard granulations of granular lids.

12. YOUNG STEMS OF PLANTS.

The young shoots are described to have served the purpose of a probe. Caraka⁵ calls them the soft variety, the metallic ones being called the hard probes. These shoots are to be used for superficial sinuses. Suśruta directs us to use the young shoots

¹ विष्टव्य चोडुव्वरशाकगोजी-
पवैभृंशं चौद्रयुतैः प्रलिम्नेत् ।

Cakradatta, Granthyavuda Cikitsā.

² वत्सांवलेखं वहुशस्तइच्छोणितमोच्चणम् ।
पुनः पुनर्विरेकच्च पिल्लरोगातुरो भजेत् ॥

Cakradatta, Netraroga Cikitsā.

वत्सांवलेखमिति । कर्कशशाखोटकादि पवेण वर्त्मघर्षणम् ।

Tattva Candrikā, Ibid.

³ चौमं प्लोतं पिञ्चं फेनं यावगृकं समैञ्चवं ।
कर्कशानि च पताणि लेखनार्थं प्रदापयेत् ॥

Suśruta Saṁhitā, IV, i.

⁴ Paul, III, xxii.

⁵ See foot-note 4, P. 269.

of the pot-herbs called Cuñca and Upādikā (Basella Rubra) as probes in sinuses on the eyelids and arround the anus.¹

If in young people the teeth become loose as the result of some injury, the patient should be directed to live upon milk only, sucking it through the stalk of lily; and thus affording the teeth rest and a chance of being firmly fixed again.²

To excite emesis, Sāringadbara,³ advises us to introduce a tube of Eranđa (Ricinus Communis) into the throat of the patient. The vomiting is also said to have been excited by thrusting a finger or a stalk of lily down the throat.

¹ नाड़ी व्रणान् शत्यगर्भातुन्माग्युत्सङ्घिनः श्वैः ।
करिरवालांगुलिभिरेषणा वैष्येण्डिष्क् ॥
नेच्चवर्म्मगुदाभ्यासनादोऽवकाः शशोणिताः ।
चुच्चुपोदकज्ञैः श्वकाः करीरैरेषयेऽन्तुताः ॥

Susruta Samhitā, IV. i.

² अभग्नांच्छितान्दन्त्वान् सरक्तानवपीडयेत् ।
तस्य सनुष्टस्य श्रीतैरगलेपयेष्ठिः ॥
सिद्धाम्बुभिस्तः शितैः सन्धा त्वैरुपाचरेत् ।
उत्पलस्य च नालिन द्वीरपानं विधीयते ॥

Susruta Samhitā, IV. iii.

³ अज्जीर्ण कोषापानीयं सिम्बु पीला वमत् सुधोः ।
वमनं पात्रित्वा च जानुमाचासने स्थितम् ॥
कर्गहर्त्तरणालेन स्पृशन्तं वासयेण्डिष्क् ।
लक्ष्माणं वमतः पुंसः पाश्वीं द्वौ च प्रशीधयेत् ॥

Sāringadbara Saṅgraha, III. iii,

CHAPTER VIII.

HYGIENIC APPLIANCES AND HOSPITAL REQUISITES.

TOOTH-BRUSH.

The ancient Hindus used branches of trees as tooth-brush. They should have the length of twelve anguli and the circumference equal to that of the little finger. Suśruta directs us to use a straight and plain branch of such trees as have an astringent, or sweet, or bitter, or sour taste¹. Amongst these classes of trees, the twigs of Khadira (Acacia Catechu), Madhuka (Brassia Latifolia), Nimva (Melia Azadirachta), Karñja (Pongamia Glabra) are the best. The end of the stick is to be chewed first to form a brush and the teeth are then to be rubbed with it. He recommends us to use some tooth-powder.²

¹ तत्रादौ दत्तपवन इदंशाङ्कुल मायतं ।
कनिष्ठिका परिणाह सज्जयथितमन्नरणं ॥
अयुग्मयन्ति यज्ञापि प्रत्यग्ं शस्तभूमितं ।
अवेत्यत्तुच दीपत्र रसं वीर्यत्र योजयेत् ॥
कषायं मधुरं तिक्तं कटुकं प्रातरुद्धितं ।
निम्बय तिक्तके शेषः कषाये खदिरस्तथा ।
मधुको मधुरे शेषः करञ्जः कटुके तथा ॥

Suśruta Saṁhitā, IV, xxiv

² चौद्र व्योष विवर्गाकं सतैलं सैम्बवेन च ।
चूर्णेन तेजोवत्याश दत्तान्निलं विशेषयेत् ॥
एकैकं घर्षयेदन्तं सृष्टुना कूर्चकेन च ।
दत्तशोधन चूर्णेन दत्तमांसन्यवाधयन् ॥

Ibid.

Bhāvamīśra mentions the names of other trees which may be used for the purpose,¹ and also gives us a list of trees to be avoided.² The use of the tooth-brush is contra-indicated in the various diseases of the mouth, ears, &c.³ Caraka⁴ advises us to use the tooth-brush twice a day.

¹ ऋक्षे वीर्यं वटे दौसिः करञ्जे विजयो भवेत् ॥
 प्रच्छे चैवार्थसम्पत्तिर्वदर्थां मधुरोधनिः ।
 खदिरे सुखसौगम्यं विलवेतु विपुलं धनम् ॥
 उदुम्बरे तु वाक्सिङ्गिरावेलारोग्यमेव च ।
 कदम्बे तु धृतिर्मधा चम्पके च टटामतिः ॥
 शिरीषे कीर्तिमौभाग्य मायुरारोग्यमेव च ।
 अपामार्गं धृतिर्मधा प्रज्ञाशक्तिस्थाधनिः ॥
 दाढ़िम्यां सुन्दराकारः ककुमे कुटजे तथा ।
 जातीतगरमन्दरैदुःखप्रच विनश्यति ॥

Bhāva Prakāśa, I. i.

² गुवाकस्तालहिन्नालौ केतकञ्च छहतृण् ।
 खञ्जुरं नारिकेरञ्च सरैते दण्डराजकाः ॥
 दण्डराजं समुत्पन्नं यः कुर्याद् दत्तधावनम् ।
 नरश्चाग्नाल धोनिः स्यादयावद्धान्नं पश्यति ॥

Ibid.

³ नखादेइगलताळ्लोष्ट जिह्वारोग समुद्धवे ॥
 अथास्यपाके श्वासेच कामहिका वमीषु च ।
 दुर्वलो जीर्णं भक्तश्च मूर्च्छात्तीमदपीडितः ॥
 शिरोरुगार्त्तसृषितः श्रान्तः पानक्लमान्वितः ।
 अद्विती कर्णशूलीच दत्तरोगोच मानवः ॥

Suśruta Saṁhitā, IV. xxiv

⁴ आपोयिताग्यं हौ कालौ कषायं कटुतिक्तकम् ।
 भक्षयेद्दत्तपवनं दत्तमांसान्यवाधयन् ॥
 निहन्ति गम्भैरस्य जिह्वादन्नास्यजं मलम् ।
 निष्कृत्य रुचिमाधत्ते सदो दत्तविशोधनम् ॥

Caraka Saṁhitā, I. v.

Suśruta mentions the use of a tooth-brush to extract a fish-bone from the throat.¹

After cleansing the mouth with water after meals, I'Tsing ordains² "Chew tooth-wood in the mouth; let the tongue as well as the teeth be carefully cleaned and purified." Again he says: "It is surely not seemly for any one to spend his time after meals chaffing and chattering, nor is it right to remain impure and guilty all day and night, without preparing water in a clean jar or without chewing a tooth-wood."

He continues³: "Every morning one must chew tooth-woods, and clean the teeth with them, and rub off the dirt of the tongue as carefully as possible. Only after the hands have been washed and the mouth cleansed is a man fit to make a salutation; if not, both the saluter and the saluted are at fault. Tooth-wood is Danta-kāṣṭha in Sanskrit—danta, tooth, and kāṣṭha, a piece of wood. It is made about twelve finger-breadths in length, and even the shortest is not less than eight finger-breadths long. Its size is like the little finger. Chew softly one of its ends, and clean the teeth with it. If one unavoidably come near a superior, while chewing the woods, one should cover the mouth with the left hand.

Then breaking the wood, and bending it, rub the tongue. In addition to the tooth-wood, some tooth-picks made of iron or copper may be used or a small stick of bamboo or wood, flat as the surface of the little finger and sharpened on one

¹ स्तुना वा दत्तधावनक्रूच्केनापहरित् ।

Suśruta Saṃhitā, I. xxvii.

² I'Tsing. Records of the Buddhist Religion.—Takakusu. P. 26-7.

³ Ibid. ch. viii. Use of Tooth-woods. P. 33.

end, may be used for cleaning the teeth and tongue ; one must be eareful not to hurt the mouth. When used, the wood must be washed and thrown away.

Whenever a tooth-wood is destroyed, or water, or saliva is spit out, it should be done after having made three fillips with the fingers or after having coughed more than twiee ; if not, one is faulty in throwing it away. A stick taken out of a large piece of wood, or from a small stem of a tree or a branch of an elm, or a creeper, if in the forest ; if in a field, of the paper mulberry, a peach, a sophora japonica (Huai), willow tree, or anything at disposal, must be prepared sufficiently beforehand. The freshly cut stieks (lit. wet ones) must be offered to others, while the dry ones are retained for one's own use.

The younger priest ean ehew as he likes, but the elders must have the stiek hammered at one end *and made soft* ; the best is one whieh is bitter, astringent or pungent in taste, or one whieh beeomes like cotton when ehewed. The rough root of the Northern Burr-weed (Hu Tai) is the most exellent ; this is otherwise ealled Tsâng-nrh or Tsae-urh, and strikes the root about two inehes in the ground. It hardens the teeth, scents the mouth, helps to digest food, or relieves heart-burning. If this kind of tooth-cleaner be used, the smell of the mouth will go off after a fortnight. A disease in the canine teeth or toothache will be eured after a month. Be careful to chew fully and polish the teeth eleanly, and to let all the mouth-water eome out ; and then to rinse abundantly with water. That is the way. Take in the water from the nose once. This is the means of securing a long life adopted by Bodhisattva Nágárguna. If this be too hard to put in practice, to drink water is

also good. When a man gets used to these practices he is less attacked by sickness. The dirt at the roots of the teeth hardened by time must all be cleaned away. Washed with warm water, the teeth will be freed from the dirt for the whole of life. Tooth-aehe is very rare in India owing to their chewing the tooth-wood."

TOOTH-PICK.

Suśruta advises us to use sticks of grass as tooth-pick after meals to extract particles of food lodged between the teeth, otherwise these will decompose and the mouth would be smelling badly.¹ Bhāvamiśra gives similar directions but adds that if any particles of food cannot be easily extracted by the tooth-pick, one must not use any force to extract them.² "After eating they cleanse their teeth with a wilow stick, and wash their hands and mouth."³

JIVĀ NIRLEKHANA OR TONGUE SCRAPER.

Suśruta says: "To scrape the tongue, a golden, or silver, or

¹ दन्तान्तरगतं चान्नं शोधनेनाहरिक्ष्णैः ।

कुर्यादनाहतं तद्वि सुखस्यानिष्टगम्भतां ॥

Suśruta Saṁhitā, I. xlvi.

² एवं भूक्ता भमाचामेद्रूचयहण पूर्वकम् ।

भीजने दन्तलग्नानि निर्हत्याचमनं चरेत् ॥

दन्तान्तरगतं चान्नं शोधनेनाहरित् श्वैः ।

कुर्यादनिहतं तद्वि सुखस्यानिष्ट गम्भताम् ॥

दन्तलग्ननिहत्यं लिङ्गं सन्वेत् दन्तवत् ।

न तव वहुशः कुर्याद् यदं निर्हरणं प्रति ॥

Bhava Prakāsa, I. i.

³ Bœl's Records of the Buddhist Religion. Trans. from Hiuen Tsiang, vol. I, p. 77.

wooden seraper is to be used. It should be ten anguli long and must be pliant and polished”¹. Caraka² mentions tongue-scrapers of copper, lead or brass. Bhāvamisra³ also gives a similar discription. It is to be used for scraping the deposit on the tongue. It is still commonly used in India.

RAZOR AND SHEARS. THE PRACTICE OF SHAVING.

Every one is recommended by Suśruta to have his beard shaved, hair trimmed and nails pared.⁴ Caraka⁵ also advises

¹ जिह्वानिर्लेखनं रौप्यं सौवर्णं वार्चमेव च ।

तन्मलापहरं शस्त्रं मृदुश्लक्षणं दशाङ्गुलं ॥

Suśruta Saṁhitā, IV. xxiv.

² सुवर्णरूप्यताभाणि वपुरीतिमयानि च ।

जिह्वानिर्लेखनानि सुरतीक्षणान्यनृजूनि च ॥

जिह्वामूलगतं यच्च मलमुक्त्वा सरोधि च ।

सौगत्यं भजते तेन तस्माज्जिह्वां विनिर्लेखत् ॥

Caraka Saṁhitā, I. v.

³ जिह्वानिर्लेखनं हैमं राजतं ताम्रजं तथा ॥

पाटितं मृदु तत् काष्ठं मृदुपदमयं तथा ।

“तत् काष्ठं” दलशोधनयोग्यं काष्ठम् ।

दशाङ्गुलं मृदु स्त्रिघ्यं तेन जिह्वां लिखेत् सुखम् ।

तज्जिह्वा मलवैरस्य दुर्गम्य जड़ता हरम् ॥

Bhāva Prakāśa, I. i.

⁴ पापोपशमनं केशनखरोभापभार्जनं ॥

हर्षनाघव-सौभाग्य-करमुत्साह वर्द्धनं ।

वाणवारं मृजावर्णं तेजोवलं विवईनं ॥

Suśruta Saṁhitā, IV. xxiv.

तवादित एव नीचनखरोमा * * *

Ibid.

⁵ पौष्टिकं ब्लघ्यमायुष्यं शुचिश्पविराजनम् ।

केशमशुनखादीनां कल्पनं संप्रसाधनम् ॥

Caraka Saṁhitā, I. v.

us to shave regularly, that is thrice in a fortnight.¹ Bhāvamīśra says that this practice conduces to health, beauty, longevity and purity, and should be observed every fifth day². Razor is mentioned in the R̄gveda³ and in the Kaṭhopaniṣad of the White Yayu.⁴ In the Śatapatha Brāhmaṇa, we find the method of shaving well described.⁵ “Then (in shaving) are used a porcupine quill spotted in three places and a copper razor; that three-spotted porcupine’s quill resembles the three-fold science and the copper razor resembles the Brāhmaṇa; for Brahmā is fire, and fire is of reddish (lohitā) colour, hence a copper (loha), razor is used”.

Again we read⁶ :—“For impure, indeed, is that part of man where water does not reach him. Now at the hair and beard, and at the nails the water does not reach him; hence when he shaves his hair and beard, and cuts his nails, he does so in order that he may be consecrated after becoming pure.

¹ विः पञ्चस्य केशस्मयुलोपनखान् संहारयेत् ।

Carakas Saṁhitā, I. viii.

² पञ्चरात्रावरव ग्रस्मयुकेशरोमाणि कर्त्तयेत् ।
केशस्मयु नखादीनां कर्त्तनं सम्प्रसाधनम् ।
पौष्टिकं धन्वमायुषं शैचकान्तिकरं परम् ॥
“सम्प्रसाधनम्” शोभाजनकम् ॥

Bhāva Prakāśa, I. i.

³ सं नः शिशीहि भुरिजोरिव चुरंरास्वरायो विसोचन ।

R̄gveda, S M. 4 S, 5 A. 7 A. 16 V.

⁴ चूरस्य धारा निश्चिता दुरत्यय दुर्गम्यथस्त् कवयो वदन्ति ।

Kaṭhopaniṣad, I. iii.

⁵ Śatapatha Brāhmaṇa, II. 6. 4. 5.

⁶ Ibid. 111. 1.2.2.

3. Now some shave themselves all over, in order that they may be consecrated after becoming pure all over; but let him not do this. For even by shaving the hair of his head and his beard, and by cutting his nails he becomes pure; let him therefore shave only the hair of his head and his beard, and cut his nails.

4. In the first place he cuts his nails, first of the right hand, for in human (practice) those of the left hand (are cut) first, but with the gods in this manner. First he cuts those of the thumb—for in human practice those of the little fingers are cut first, but with the gods in this manner.

5. He first passes (the comb) through his right whisker—for in human (practice they comb) first the left whisker, but with the gods in this manner.

6. His right whisker he moistens first with the text “may this divine water be propitious unto me”.....

There upon he lays a stalk of sacrificial grass on (the hair of the whisker) with the text “O plant, protect me”..... Thereto he applies the razor, with the text “O knife, injure him not”.

8. Having cut off (part of the stalk and hair), he throws it into the vessel of water. Silently he moistens the left whisker; silently he lays the stalk of grass on it; and having silently applied the razor thereto and cut through (it and the hair) he throws them into the vessel of water.

He then hands the razor to the barber, and the latter shaves off the hair and beard. When he has shaved the hair and beard.....

10. He bathes.....

12. He steps out (from the water) towards the north-east, with the text "cleansed and pure I go forth from them ;".....

13. He then puts on (a linen) garment etc."

"The Atharva-veda relates how, when the ceremony of shaving off his beard was performed on king Soma, Váyu brought the hot water and Savitri skillfully wielded the razor."¹

In para. 3, quoted above, we have evidence of the practice of depilation of the pubes which is here forbidden. There are six important rules and six minor rules of ordination for the female members or Śrāmaneris of the Buddhist order. One of the six minor rules is : A female must not shave the hair in any place but the head.² "Aristphanes, a contemporary of Hippocrates,³ Persius⁴ and Juvenal⁵ refers to the depilation of the pubes as being common among certain classes, and the early Christian Fathers deplore the practice. See also the remarks of Seutonius on the conduct of Domitan"⁶. Prosper Alpinus (16th century) "found the custom still prevalent among the Egyptian women"⁷. "The custom survived in France, and Italy in the 16th century"⁸.

KESA PRASADHANI OR COMB.

Suśruta directs us to comb the hair to free the head from dust,

¹ Maedonne's Sanskrit Literature, p. 164.

² See I'Tsing, P. 97, Foot-note 3. Vinaya Saṅgraha. Chap. xii.

³ Hippocrates, Ran. 516, Lys 89, 151.

⁴ Persius, iv. 37.

⁵ Juvenal, vii. 114.

⁶ Seutonius, xxii.

⁷ Medicina Aegyptiorum, 111. xv.

⁸ Milne, Surgical Instruments &c., p. 90-91.

louse and dandruff.¹ Bhāvamīśra advises us to comb the hair every day to keep it clean, as it stimulates the growth of hair.² Caraka³ also recommends us to keep the hairs clean. The practice of combing the hair is very ancient; the Atharva-veda mentions a comb with a hundred teeth.

LOOKING-GLASS.

The looking-glass should be constantly used as thereby the complexion is said to be improved and life prolonged⁴. For an account of the looking-glass of the ancient Hindus, see Mitra's Indo-Aryans⁵.

DRESS.

Silk, chintz and red clothes are good for the winter, for they are said to be useful for derangement of air and phlegm. Thin silk is cooling and is efficacious for biliary disorders; so it should be used during the summer. It should be coloured twany or red. White clothes are auspicious and are neither hot

¹ केशप्रसाधनी केश्या रजोजन्तु मलापहा।

Sūśruttā Samhitā, IV, xxiv.

² केशपाणि प्रकृत्यैति प्रसाधन्या प्रसाधनम्।

केश प्रसाधनं केश्यं रजोजन्तु मलापहम्॥

Bhāva Prakāśa, I, i.

³ माधूविशः प्रसाधितकेशो * * *

Caraka Samhitā, I, viii.

⁴ आदर्शलोकनं प्रोक्तं माहात्म्यं कालिकारकम्।

पौष्टिकं वल्यमायथं पापलक्ष्मी विनाशनम्॥

Bhāva Prakāśa, I, i.

⁵ The Indo-Aryans Vol. I, p. 240,

nor cold; therefore they should be worn during the rains¹. Caraka says that pure dress conducees to longevity, happiness and fortune².

UṢNĪṢA OR HEAD DRESS.

Suśruta³ advises us to use a cap on our head which is thus protected from injury. Bhāvamīśra says that the habitual use of some form of covering for the head stimulates the growth of hair, increases beauty of the head and protects it from dust, draughts and accumulation of phlegm. Only light caps should be used as the heavy varieties derange bile and cause diseases of the eyes.⁴ For the diagrams of the various forms of turbans used by the ancient Hindus, see Mitra's Indo-Aryans.⁵

¹ कोशीयौर्ध्विक वस्त्रज्ञ रक्तवस्त्रन्यैव च ।

वातश्वेष्म इरलतु शीतकाले विधारयेत् ॥

“कोशीयं” पटाखरं च सरवस्त्रञ्च ।

मध्यं सुशीतम्भिन्नं कषायं वस्त्रमुच्चते ।

तद्वारयेदुष्णकाले तवापि लघु शस्तते ॥

कषायद्वीकटी इति लोके, कषाय रागरक्तं वा ।

शुक्लन्तु शुभदं वस्त्रं शीतातप निवारणम् ।

नचोष्णव्रचवा शोतन्तु वर्षासु धारयेत् ॥

Bhāva Prakāśa, I. i.

² काम्यं वशस्यमायुष्मलच्छीम्बं प्रहर्षणम् ।

श्रीमत् पारिषदं शस्त्रं निर्मलाम्बरधारणम् ॥

Caraka Saṁhitā, I. v.

Bhāva Prakāśa, I. i.

³ पवित्र केशमुशीषं वातातपरजोऽपहं ।

Suśruta Saṁhitā, IV. xxiv.

⁴ उच्छीषं क्षान्तिकत्केश्यं रजोवात् कफापहम् ।

लघु तच्छ्वने यथाद् गुरु पित्तादिरोगकृत् ॥

Bhāva Prakāśa, I. i.

⁵ The Indo-Aryans, Vol. I, p. 220.

CHATRA OR UMBRELLAS.

Suśruta says: Umbrellas are useful for protecting men from the rains, draughts, glare of the sun, exposure to cold, and dust. They are auspicious and are beneficial to the eyes¹. Caraka² advises us to use it as it protects us from the sun, rain &c. Bhāvamīśra³ also describes its efficacy similarly. Umbrella is one of the insignia of royalty in India, and is always held over the heads of kings as shown in the Sanchi and Amarāvatī sculptures⁴. It is still commonly used in India.

YĀSTI OR STICKS.

Caraka⁵ directs us to use a stick as a support. Suśruta says: "By using sticks, a man gains in strength, prowess and manliness. He becomes courageous, patient and forbearing. He can stand erect and is not troubled by any fear"⁶. It

¹ वर्षानिलरजोघम्भे हिमादीनां निवारणं ।

वर्ष चतुष्प्रभौजसं शङ्करं क्वचधारणं ॥

Suśrata Samhitā, IV. xxiv.

² ईतेविधमनं वल्यं गुप्तावरणशङ्करम् ।

घम्भानिलरजोऽनुग्नं क्वचधारणमुच्यते ॥

Caraka Samhitā, I. v.

³ क्वदस्य धारणं वर्षातपवात रजोऽपहम् ।

हिमध्नं हितमस्योश्च माङ्गल्यमपि कौरिंतम् ॥

Bhāva Prakāśa, I. i.

⁴ See Indo-Aryans, I, p. 266.

⁵ स्खलतः संप्रतिष्ठानं शतुण्णाञ्च निसूदनं ।

अवष्टमनमायुषं भयन्नं दण्डधारणम् ॥

Caraka Samhitā, I. v.

⁶ एवः सरौस्तपच्याल विषाणिभ्योभयापहं ।

शमस्खलन दोषव्यं स्थविरेच प्रश्सते ॥

सत्त्वोत्साहयत्थैर्थ्य धैर्यवीर्य विवईनम् ।

अब्दधकारच्चापि भयन्नं दण्डधारणं ॥

Suśruta Samhitā, IV. xxiv.

protects a man from dogs, snakes &c. Bhāvamīśra¹ apparently quotes these verses from Suśruta.

UPĀNAHA OR SHOES.

The ancient Hindus used two kinds of shoes, made of wood and leather. The wooden pādukā is recommended to be used before and after dinner². The good effects claimed by its use are, an increase of the power of vision, strength and longevity.³ When travelling, the upānaha or leather shoes are to be used. Besides the advantages mentioned above, shoes are very comfortable to the travellers and prevent many diseases of the feet⁴. If any one often travels barefooted, he feels out of sort, his senses fail, vision becomes impaired and his expectation of life is reduced.⁵

¹ Bhāva Prakāśa, I. i.

² पादुकारोहणदुर्यात् पूर्वं भोजनतः परम् ।
पादरोग हरं वृथं चचुष्ट्वायुषो हितम् ॥

Bhāva Prakāśa, I. i.

³ चचुष्ट्वं स्पर्शनहितं पादयोर्व्यसनापहम् ।
वल्यं पराक्रमसुखं वृथं पादचधारणम् ॥

Caraka Saṃhitā, I. v.

⁴ पादरोगहरं वृथं रक्षोग्नं प्रीतिवदेनं ।
सुखप्रचारमीजसं सदापादवधारणं ।
अनारोग्य मनायुष्यं चचुष्ट्वोरुपवातकत् ।
पादाभ्यामनुपानद्वां सदा चंक्रमणं नृणां ॥

Suśruta Saṃhitā, IV. xxiv.

⁵ उपानद्वारणं नेवभायुष्यं पादरोगहत् ।
सुखप्रचारमीजसं वृथच्च परिकौर्चितम् ॥
पादाभ्यामनुपानद्वां सदा चंक्रमणं नृणाम् ।
अनारोग्य मनायुष्मिन्द्रियग्नं भट्टिदम् ॥

Bhāva Prakāśa, I. i.

The Hindus wore sandals like the ancient Greeks. They also used boots, which look like the modern boots used by Europeans. Buddha gave the Bhikkhus permission to wear boots or shoes, with thick lining¹. Hiuen Tsiang² says that "here (Avantī) Tathagatha gave permission to the Bhikkhus to wear kih-fu-to (boots)." For an account and figures of ancient boots used by the Hindus, see Indo-Aryans.³

VYĀJANI AND CĀMARA. THE FAN.

The fan was used for airing the patients to drive away flies.⁴ Suśruta mentions the cāmara *i.e.*, the tail of the Thibetan yolk (*Bos grunnius*) to be used as a fan. "It soothes the inflammation of boils and also acts as a fly-brush to prevent infection of the open wound"⁵. The cāmara is also one of the insignia of royalty and as such we have many representations of it in the sculptures of ancient India⁶. For diagrams of the ancient fan, see Indo-Aryans⁷.

Caraka directs us to use a kūlā or fan to winnow corn, prepared from the kāśa (*Saccharum Spontanum*) to resuscitate a still-born child⁸.

¹ Mōhāvagga, varga 13 ff 6. S. B. E. vol. xvii. p. 35.

² Beal's Records of Buddhist Religion, vol. II. p. 280.

³ Indo-Aryans, Vol. I, p. 123-6.

⁴ वालव्यजनं मौजस्य मचिकादीनपोहति ।

शेषदाह अमस्वेद मूच्छाप्तो व्यजनानिलः ॥

Suśruta Saṁhitā, IV. xxiv.

⁵ व्यज्येत वालव्यजनैर्ब्रणं न च विघटयेत् ।

Ibid., I. xix.

⁶ See Indo-Aryans, vol. II, p. 267-70.

⁷ For diagrams, see Indo-Aryans, vol. I, p. 263.

⁸ तथा संक्षेशविहतान् प्राणान् पुनर्लभेत् क्षणकपालिकागूर्ध्वेण चैनमभिनिष्टुनीयाद-
यच्चेष्ट् स्यात् यावत् प्राणानां प्रत्यगमनं तत्तत्सर्वमेवकुर्यात् ॥

Caraka Saṁhitā, IV. viii.

Bhāvamīśra¹ mentions fans made of the following materials:—palm leaf, bamboo, yolk's tail, cloth, peacock's feather and cane. He attributes peculiar properties to each fan.

Rājavallabha says² that “the palm-leaf fan overcomes disturbances of all the three humours, and is light and agreeable; the bamboo fan causes heat and irritability, and promotes inordinate secretion of the two humours—air and bile; the cane, cloth and peacock's feather fans, overcome disturbances of the three humours; the hair fan is invigorating etc.”

The Buddhist Bhiksus used the palm-leaf fan. “Not unfrequently there is added a lotus-leaf shaped fan, made from a single frond, with an edging of bamboo or light wood, and furnished with a handle fashioned like the letter “S”. The palm from which the leaf is taken, is also that used for the mss., namely the Talipot; hence the name Talponi given to the Bhikkhus by the early Portuguese adventurers in Burma. When he attended a meeting at which women are likely to be present, every Bhikkhu must have the fan.”³

¹ व्यजनस्यानिलो दाह रवेदमूर्च्छा श्रमापहः ।
तालबन्नभवी वातस्त्रिदोषशमको मतः ॥
वंशव्यजनजसुणो रक्तपित्तप्रकोपणः ।
चामरो वस्त्रसम्भूतो मायूरो वैवजस्थथा ॥
एते दोषजिता वाताः क्षिण्धा हृद्याः सपूजिताः ।

Bhāva Prakāśa, I. i.

² तालव्यजनगुणः—त्रिदोषगमनत्वम् । लघुत्वम् ॥ वंशव्यजनगुणः—रुचत्वम् ।
उष्णत्वम् । वायुपित्तकारित्वम् ॥ वैववस्त्रमयूरपुच्छव्यजनगुणः—चिदोषनाशित्वम् ।
वालव्यजनगुणः—तेजस्करत्वम् । मचिकादि निवारकत्वम् ।

Rājavallabha.

³ The Way of Buddha, p. 53-54.

FILTERS.

Filters were used by the Hindus and are recommended to be made of an earthen or metallic vessel, the mouth being closed by a piece of cloth tied round its neck.

If the water be filthy, Suśruta¹ advises us to purify it by boiling it or by exposure to the sun; or by throwing hot iron balls, sand or clay balls into the water and then allowing it to cool. Such purified water should be scented with the flowers of Nāgakeśara (Mesua Ferrea), Campaka (Michelia Champaca), Utpala (Nymphaea Stellata) and Patala (Bignonia Snavolens).

Suśruta mentions seven means of purifying polluted water², viz.,

1. Kataka phala or nirmālāya or seeds of Strychnos Potatorum.
2. Gomedaka or a kind of gems.
3. Viṣagrāntha, or root of Nelumbium Speciosum.
4. Śaivālamūla or root of Vallisneria Spiralis.
5. A piece of cloth.
6. Pearls.
7. Precious Stones and crystals.

¹ व्यापनानामयिकथनं सूर्यातपप्रतापनं तपायःपिण्डसिकतालोक्षणां वा निर्बापनं प्रसादनच्च कर्त्तव्यं नागचम्पकोच्चलपाटलापुष्पप्रभृतिभिश्चिवासनमिति ।

Suśruta Saṁhitā, I. xlvi.

² तत्र सप्तकलुषस्य प्रसाधनानि भवन्ति । तद्यथा । कतकगीभेदकविषयग्निशैवालमूल-वस्त्राणि मुक्तामणिश्चेति । पञ्चनिकेपणानिभवन्ति । तद्यथा । फलकं वज्रकं मुञ्जवलय उदकमच्चिकाणिक्यच्चेति । सप्तशीतिकरणानि भवन्ति । प्रवातस्यापनमुदकप्रक्षेपणं यटिकाभासणं व्यजनं वस्त्रोऽग्रणं वानुका प्रक्षेपणं शिक्षावलम्बनच्चेति ।

Ibid.

He mentions five kinds of means for preventing contact of the water vessel with the earth¹ :—

1. Phalaka or planks as of Śālmali wood.
2. Tryastaka or octagonal tripod of wood.
3. Muñjvalaya or circular pad of Saecharine Muñja.
4. Udagamañcikā or a raised framework of cane and bamboo.
5. Sikya or a loop suspended by three strings.

He mentions seven ways of cooling water :—

1. Exposure to air.
2. Sprinkling water on the vessel.
3. Stirring the water with a rod.
4. Fanning the water.
5. Filtration through cotton fabrics.
6. Putting the vessel of water on a sand bed.
7. Suspension of the vessel in a loop.

He advises us to use rain water filtered through a broad piece of white and clean cloth². In collecting water from the rivers and ponds, the Hindu females still use a kalasī or earthen vessel, the mouth being closed by a piece of cloth.

¹ In the English translations of the Suśruta Saṁhitā, Bibliotheca Indica, Dr. Cattopādhāya translates the passage incorrectly. He misunderstood the terms phalaka, &c. to be remedial agents, necessary in the purification of water.

² गाहः पुनः प्रधानं तटुपाददीताश्वयजे मासि शुचिशक्तिवित तपटैकदेश्युतमय वा हम्मतलपरिष्वस्तमन्वैर्वा शुचिभिर्माजनैर्गृहीतं ।

Suśruta¹ deprecates impure water as injurious to the human system and advises us not to drink or bathe in such water as there is always the risk of being speedily affected with many diseases.

"It (filter) forms one of the eight sacred utensils necessary for a sramana of the Buddhist order. It is a strainer or water-dipper—an apparatus for filtering the water which he drinks, so that he may not, even unwillingly, take animal life"²

One of the six requisites of a Bhikṣu is Parisrāvana, a water-strainer³.

WATER VESSEL.

To store water, Suśruta mentions vessels of gold, or silver, or earth⁴.

"The clean water is kept separately from water for cleansing purposes (*lit.* 'touched' water), and there are two kinds of jars (*i.e.* kundi and kalasa) for each. Earthenware or porcelain is used for the clean jar, and the jar, for water for cleansing purposes (*lit.* touched water) is made of copper or iron. The clean water is ready for drinking at any time, and the 'touched' water for cleansing purposes after having been to the urinal.

¹ व्यापनं वर्जयन्नित्यं तोयं यद्वाप्यनार्चवं ।
दीषसञ्जननं स्मै तत्राददीताहितनु तत् ॥
व्यापनं सलिलं यस्तु पिवतीहा प्रसाधितं ।
श्वयथुं पाण्डुरोगञ्च त्वग्दीषमविपाकतां ॥
श्वासकासप्रतिश्वायगृलगृलभोदरानि च ।
अन्यान् वा विषमान् रोगान् प्राप्तुयात् चिप्रमेव च ॥

Suśruta Saṃhitā, I. xlvi.

² The way of Buddha, p. 53.

³ I'Tsing, ch. x.

⁴ सौवर्णं राजते सून्मये वा पाते निदध्यात् तत्सार्वकालसुपथ्यज्ञीत तस्यालाभे भौमम् ।

Ibid.

The clean jar must be carried in a clean hand, and be placed in a clean place, while the jar for the ‘touched’ water should be grasped by the ‘touched’ (or ‘unclean’) hand and be put in an unclean (or ‘touched’) place. The water in a pure and fresh jar can be drunk at anytime; the water in any other jar is called ‘special water’ (more *lit.* seasonable water *i.e.* water to be used at certain prescribed times, probably *kālodaka*).¹

BATHING.

The Hindus in their daily life do not eat without having first washed themselves in a bath. They always use a bathing-sheet and this ancient practice is still followed.

Bhāvamīśra says² : “Bathing stimulates the appetite, virile power and strength, prolongs life, allays thirst and burning sensation, cures eczema, and washes out dirt and perspiration.”

Besides the ordinary bath, there is some evidence of the use of a medical bath to cure diseases. I’Tsing says³ : “The World-honoured One taught how to build a bath room, to construct a brick pond in an open place, and to make a medical bath in order to cure a disease. Sometimes he ordained the

¹ I’Tsing, ch. vi.

² दीपनं हृष्मायुषं स्नान मोजो वलप्रदं ।

कण्डुमलथमःस्वेदतन्द्रा वड्‌दाह पापनुत् ॥

वाहैर्य सेकेः शीताद्यै रुध्माल्याति पीडितः ।

नरस्य स्वातमाचस्य दीप्यते तेन पावकः ॥

शीतेन पथमा स्वातं रक्तपित्तप्रशान्तिकृत् ।

तदेवोषेन तीयेन वल्यं वातकफापहम् ॥

शिरः स्नानमच्छयं मत्युषेनाम्बुद्धां सदा ।

वातस्थीम् प्रकोपेतु हितलच्च प्रकीर्तितम् ॥

Bhāva Prakāśa, L. i.

³ I’Tsing, ch. xx.

whole body to be anointed with oil, sometimes the feet to be rubbed with oil every night, or the head every morning ; for such a practice is very good for maintaining clear eyesight and keeping off the cold.” “Bathing should always take place when one is hungry. Two kinds of benefits are derived by having meals after bathing. First, the body is pure and empty, being free from all dirt, second, the food will be well digested, as the bathing makes one free from phlegm or any disease of the internal organs. Bathing after a good meal is forbidden in the ‘Science of Medicine’ ” (Kikitsā-Vidyā).

DRINKING VESSEL.

Scented water is advised to be drunk out of cups made of gold, or silver, or copper, or bell-metal, or lapis lazuli or earth.¹ Bhāvamiśra² also mentions cups of the same materials.

“To drink from a jar holding it upright in front is no fault ; but drinking in the afternoon is not permissible. A jar must be made to fit one’s mouth ; the top of the cover should be two fingers high ; in it a hole as small as a copper chopstick is made.

Fresh water for drinking must be kept in such a jar. At the side of the jar there is another round hole as large as a small coin, two fingers higher than the drinking-mouth. This hole is used for pouring in water ; two or three gallons may be put in it. A small jar is never used.

¹ See foot-note 2, P. 65.

² जलपावन्तु तासस्य तदभावे सदोहितम् ।

पवित्रं शीतलं पात्रं गठितं स्फटिकेन यत् ॥

काषेन रचितन्नइत्था वैदूर्यं सम्बवम् ।

If one fear that insects or dust may enter in, both the mouth and the hole may be covered by means of bamboo, wood, linen, or leaves. There are some Indian priests who make jars according to this style. In taking water the inside of the jar must be first washed in order to get off any dirt or dust, and then fresh water must be poured in.

A priest who travels, carries his jars, bowl, necessary clothes, by hanging them from shoulders over his cloak, taking an umbrella in his hand. This is the manner of the Buddhist priests in travelling¹."

DINNER SERVICE.

Suśruta² advises us to use different kinds of vessels for distributing the various kinds of food :—

Iron vessels for ghee or clarified butter.

Silver vessels for drinks, soups and gruels.

¹ I'Tsing, ch. vi.

² वृतं कार्णायसे देयं पेया देयात् राजते ॥
फलानि सर्वभव्यांश्च प्रदद्यादेव लिषु च ।
परिशुक्षप्रदिग्धानि सौवर्णेषु प्रकल्पयेत् ॥
प्रदवाणि रसां शैव राजतेषु पहारयेत् ।
कटुराणि खडां शैव सर्वान् शैलिषु दापयेत् ॥
दद्यात्ताम्बमये पात्रे मुशीतं मुश्टं पयः ।
पानीयं पानकं भयं मन्मयेषु प्रदापयेत् ॥
काचस्फटिकपात्रेषु शीतलेषु शुभेषु च ।
दद्यादूर्थपात्रेषु रागधाडवस्त्रकान् ॥
पुरस्ताद्विमलं पात्रे मुविस्तौर्णे मनोरमे ।
मृदः मुषीदनं दद्यात् पर्देहांश्च सुसंस्कृतान् ॥

Plantain leaf vessels for fruits and sweetmeats.

Gold vessels for flesh.

Stone vessels for whey.

Copper vessels for milk.

Earthen vessels for water, sherbets and wines.

Glass, crystal, lapis lazuli vessels for rājśādava and sattaka.

In the Bhāva Prakāśa¹ we have a detailed desription on the subject—"A dinner service of gold is the best from a medicinal point of view, and it is supposed to be the best tonie for the eye. Eating out of silver is equally effieacious for promoting hepatic funetions. A serviee of zinc improves the intelligence and appetite. Food served in brass utensils promotes wind and heat, but eures phlegmatic disorders and expells worms. The use of steel or glass vessel cures ehlrosis, jaundice and intumeseence. A stone or clay service brings on poverty. Wooden plates are good appetisers, but help the secretions of phlegmatic humour. The use of certain leaves as plates aets as an antidote against poisons. When at dinner, a water jug with a eup should be placed on the right hand. A copper vessel is the best for the purpose. The next best is an earthen pot. Vessels made of crystal and lapis lazuli are also pure and cooling".²

¹ आयसि काचपावे च भोजनं सिद्धिकारकम् ।

गोथ पाण्डुहरं वल्यं कामलापहसुत्तमम् ।

ग्लैडी चतुर्मध्ये पावे भोजनं श्रीनिवारणम् ।

दारुद्ववे विशेषणं रुचिदंशे प्रकारितु ।

पावं पतमर्यं रुच्यं दीपनं विषपापनुत् ॥

Bhava Prakāśa, 1. i.

² History of Aryan Medical Science, p. 64-5.

SPOONS.

I'Tsing says¹: "As to the mode of eating in the West, they use only the right hand, but if one has had an illness or has some other reason, one is permitted to keep a spoon for use."

SPITTOONS.

Spittoons were commonly used by the ancient Hindus, and Caraka² mentions it as one of the things necessary for the sick room. It is also mentioned in the *Mohāvagga*³: "And the sethe's wife spat it out into the spittoon." Fa-Hian⁴ noticed a "stone spitting vessel in this country (Kie-sha) belonging to Buddha."

BEDPANS AND URINALS.

The bedpan and urinal were also used by the patients in ancient times. Caraka mentions them to be necessary in a sick room.⁵

PUS BASINS.

Metallic basins marked with different measures were used for holding discharges after operations. In the *Aśvavaidyaka*⁶

¹ I'Tsing, ch. xvi.

² चोपन्यस्तमाङ्गार प्रतिग्रहाणि ।

* * * *

प्रतिग्रहांशीपचारयेत् ॥

Caraka Saṁhitā, I. xv.

³ Sacred Books of the East. VIII. i. II.

⁴ Beal's Records, vol. I. Introduction, xxviii.

⁵ See Page 36 and foot-note 1, P. 34.

⁶ पद्मशे लोमशे निवं लोमान्युतपाद वेधर्यत् ।

प्रमाणार्थं च पाविण रक्तं गृह्णाति वृद्धिमान् ॥

Aśvavaidyaka, XV. verse 30.

blood let out in the operation of phlebotomy, is recommended to be collected in a basin, so that the quantity may at once be determined.

PESTLE AND MORTAR.

Pestle and mortar are mentioned in the R̄gveda for preparing the Soma juice.¹ And their use in pharmacy was well-known to the ancients.

Besides the pestle and mortar of pharmacy, we find mention of a large wooden pestle used in reducing dislocation by Suśruta.² Caraka says that two pestles and motars should be kept in a lying-in-room, the object being to allow the woman some kind of work; and then she will not lie down idly on her bed if there be any delay in the delivery of the child³. Suśruta also recommends it⁴. “The mortar (ulukhala) and pestle (muṣala) are to be made of very hard wood, viz., both of Varana wood (Crataiga Roxburghii), or the mortar of Palāśa wood (Butea Frondosa), and the pestle of Khadira wood (Acacia Catechu). The former

¹ उलूखलसुतानामवेदिं जलगुलः ॥

* * * *

यचिद्वित्वं गृहे गृहे उलूखलकं युज्यसे ।

R̄gveda, 1 M. 28 S. 1 & 2 R.

² See foot-note 6, P. 172.

³ See P. 39, and foot-note 1, P. 40.

सा चेदावीभिः संक्षिश्यमाना न प्रजायेताथैनां ब्रूयात् उत्तिष्ठमूष्लमन्यतरञ्ज गटङ्गीष्वानेनैतदु-
दूखलं धान्यपूर्णं महम्भुहरधिजहि मुहम्भुहरवज्ञम्भस चंक्रमस चान्तरान्तरा इत्येवसुपदिश्यन्त्यके ।

Caraka Saṁhitā, IV. viii.

⁴ काजातीतस्याग्निं गर्भं विशेषतः सधान्यसुदूखलंभूषलेनाभिहन्यादिषमे वा यानामने
संवेत ।

Suśruta Saṁhitā, III. x.

is to be of the height of the knee and the latter three aratnis (ubits) long¹."

On the inner face of the left pillar in the eastern gate of Sanehi Tope, there is a beautiful representation of a kitchen scene, in which the ancient mortar and pestle are shown. "The mortar and two-handed pestle same as those in use at the present day in India. The mortar (okhli) is exactly the same as the Greek *ἰγδη*, and the Roman *pila*; and the pestle (musar) is the same as the Greek *Κόπαρος*, and the Roman *pilum*"²

The pestle and mortar used in pharmaey was called *aśmabhālam*. It is still used to pulverise medicaments, and is made of iron or brass.

In the *Mahāvagga*³ we find a reference to the pestle and mortar. "I allow, O Bhikkhus, the use of a chunam as a medicine by whomsoever has the itch, or boils, or a discharge or seabs, or whose body is ill smelling, and to those in health the use of dry dung, and of clay, and of coloring matter. I allow, the use, O Bhikkhus, of a pestle and mortar" (*udukhalam nnsalañ ka*). ।

SIEVES, STRAINERS AND FILTERS.

There is evidence that cloth sieve was used by the Hindus in ancient days, we find it mentioned in the *Rgveda*⁴. The purpose of straining and filtering solid and liquid medicines respectively is mentioned to have been served by two or

¹ Schol. on Katy. 1.3.3.6. footnote, *Śatapatha Brāhmaṇa* (Sacred Books of the East, 1.1.4.8.)

² Cunningham's *Bhilsa Topes*, p. 207.

³ *Mahāvagga* VI. 9. 2.

⁴ *Rgveda*, 10m. 71s. V 2

three layers of a piece of cloth. And we know that in the prehistoric Soma rites, it "was pressed, passed through a sieve, mixed with milk, and offered as the main oblation".

The reference to a cloth sieve, we find in *Mohāvagga*¹: "Now at that time the Bhikkhus who were sick had need of sifted chunam as medicine.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a chunam sieve".

They had need of the chunam very fine.

"I allow, O Bhikkhus, the use of a cloth sieve".

Pavitra was used in the Vedic times². It was a filter. Wilson translates it: "Through the purifying filters".

COLD AND HOT APPLICATIONS.

To relieve eolic pains, vessels made of silver, copper or precious stones, containing cold water, are directed to be placed upon the part or better upon the navel³. Besides these, leather vessels containing cold water are also directed to be used for reducing the temperature in dilirium tremens.⁴

¹ *Mohāvagga* VI. 10. 1.

² मध्यः पुनानाः कविभिः पवित्रैर्द्युभिर्हिंन्वत्यक्तुभिर्धनुवौः ॥

Rgveda, 3m. 31s. 16 Rk.

अंशुः द्रुहन्ति हस्तिनो भरितैर्मध्यः पुनन्ति धारया पवित्रैः ॥

Ibid. 3m. 36s. 7 Rk.

³ मणिराजत तामानि भाजनानि च सर्वशः ।

वारिपूर्णानि तान्यस्य गूलस्योपरि निक्षिपेत् ॥

Suśrōta Saṃhitā, VI. xlvi.

⁴ हेमराजत कांस्यानां पाताणां शीतवारिभिः ।

पूर्णानां हिमपूर्णानां टृतानां पवनाहताः ॥

Caraka Saṃhitā, VI. xii.

Heat is directed to be applied to the patient's body in various ways¹ :—

I. *Tāpasveda* :—palm of the hand, brass dish, sand, cloth, potsherd &c. are the means mentioned for applying heat to the body.

II. *Uṣṇasveda* :—potsherds, stone, bricks, or iron balls are to be heated to redness and then water is to be sprinkled upon them. The part to be fomented is covered by a wet piece of thick lint and then the heated materials are to be applied over it. Or heat may be applied by means of a narrow vessel containing hot decoctions. The vessel is to be surrounded by a piece of

¹ चतुर्विधः स्वेदस्तु यथा । तापस्वेद उष्णस्वेद उपनाहस्तेदोद्रव स्वेद इति ।
अत सर्वस्वेद विकल्पावरीधः ॥

तव ताप-स्वेदः । पाणि कांस्यकन्दकपाल वालु कावस्तैः प्रयुज्यते शयानस्यचाङ्गतापो वहशः
खादिराङ्गारैरिति । उष्ण-स्वेदस्तु कपालं पाषाणेष्टकालोह-पिण्डानग्निवर्णनङ्ग्नि रामिष्टेदम्भ
द्रव्यैर्वते राद्रालक्तकं परिवेष्टितमङ्ग-प्रदेशं स्वेदयेत् । मांस रसं पश्चोदधि धात्याम्भवातहर
पतभङ्ग काथ पूर्णं वा कूच्छीमनुतप्तां प्राण्विष्याणं गङ्गायीयात् । पार्श्वं किंद्रेण वा कुच्छेनाधी-
मुखेन तस्य सुखमभिसन्धाय तस्मिन् किंद्रे हस्ति गुण्डाकारां नाडीं प्रणिधाय तम् रवेदयेत् ।

सुखोपविष्टं स्वभङ्गं गुरुं प्रावरणाद्वतं ।

हस्तिगुण्डिकया नाड्या स्वेदयेदात-रोगिणं ॥

मुखा सर्वाङ्गं फ्लेशा न च क्लिश्नाति मानवं ।

व्यामार्दमात्रा विर्वक्रा हस्ति इमं समाकृतिः ॥

रवेदनार्थं हिता नाडी कैलिञ्ची हस्ती गुण्डिका ।

* * * * *

उपनाह स्वेदस्तु वातहरमूलकं क्लैरम्भं पिष्टेन्द्रवणं प्रगाढैः सुखिर्गैः सुखोष्णैः प्रदिष्ट्य
स्वेदयेत् । एवं काकोन्यादिभिः मरमादिभिस्तिलातमी मर्घप कल्पैः क्लशरा पायसोत्कारिका-
भिव्वेसवारैः शाखणौर्वातनुवस्त्रावनडैः स्वेदयेत् ।

द्रव स्वेदस्तु-वातहर द्रव्यकाथ पूर्णं कोणं कटाहे द्रोण्यां वावगाम्य स्वेदयेत् । एवं पश्चोमांस-
रस-पृष्ठ-तैल-धात्याम्भ-षृत-वसा मूत्रेष्ववगाहितं सुखोष्णैः कथायैः परिपिच्चेदिति ।

cloth to prevent the skin from being burnt. Or heat may be applied by the following device :—an earthen vessel or kalasi containing hot decoctions is to be closed ; and the vessel is then to be inverted. Then a hole should be bored on its side, and a tube shaped like an elephant's proboscis is fitted to it ; the vapour issuing from the tube is allowed to play on the part.

To apply vapour bath :—put the hot infusion of medicinal substances into an earthen vessel and close its mouth. Drill a hole into the side of the vessel and adapt a tube to it. The tube may be either metallic or wooden. The tube should be two hands (forearm and hand) long and made of three pieces ; the end of the tube which should taper like a cow's tail must be six anguli long. The patient should be seated on a stool and well covered with cloth. The tube is then introduced inside the blanket, and thus the issuing vapours heat the whole body. (Śārīgadhara¹).

Suśruta says that the tube should be half byām (*i.e.*, the distance between the two hands when extended) long, bent thrice and shaped like an elephant's proboscis. Sometimes a large stone slab is to be heated with burning wood of Acacia Catechu. Then after removing the ashes, the patient is directed to lie upon it. A tent or cloth-cover having four doors is sometimes required for the patient to sit in, and heat is applied by burning wood outside it.

¹ अथवा वातनिर्णशिद्व्यक्ताथरसादिभिः ।

उच्चैर्घटं पूर्यित्वा पाञ्चे द्विद्रं विधाय च ॥

विमुद्रास्यं विलग्नात्वा धातुजां काष्ठजां तथा ।

षड्हङ्गलास्यां गोपुक्षां नाड्हौ युज्जात् विहस्तिकां ॥

मुखोपविष्टं स्वभक्तं गुरुप्रावरणावृतम् ॥

हस्तीयुग्मिक्या नाड्हा रवेद्येष्वातरोगिणम् ॥

Śārīgadhara Samgraha, III, ii.

III. Upānahasveda or poultices :—roots of medicinal plants are to be pressed and formed into a paste with mustard, sesame etc. This is to be heated, put on a thin cloth and so applied.

IV. Dravasveda or hot bath :—the patient is to sit in a tub or vessel of hot water. Iron pails or tubs are recommended to be used by patients to take bath in some infusions. Śāringadhara says¹: The tub (droṇī) should be made of gold, or silver, or copper, or iron, or wood. The height and length of the tub should measure thirty-six aṅguli each. When the patient sits inside, the height of water should stand six aṅguli above the navel. A droṇī filled with oil is to be used for placing an unconscious patient in it to overcome the shock caused by fall, blows, fractures and other injuries.

Cakradatta² describes the four methods of applying heat, Bhāvamīśra also describes them similarly³. Hārita, however, mentions seven methods of heat-application⁴.

¹ सोवर्णं राजतं वापि ताम्रमायसञ्च दारुजम् ।
कोष्ठकं तत्र कुर्वीतोऽक्राये षट्चिंशदङ्गुलम् ॥
आयमेन तदेवस्याच्चतुष्टं मस्तु तथा ।
नामेः षडङ्गुलं यावन्मयः क्वायस्य धारया ॥

Śāringadhara Saṅgraha, III. ii.

² तपैः सैकतपाणिकां व्यवमनैः स्वेदोऽथवाङ्गारक-
लं पादातहरैः सहान्त्वावगमन्ते हैः सुखोण्डैर्भवेत् ।
एवं तपपत्रोऽस्त्रवातशमनकाथादिमेकादिभि-
स्तैसोयनिषेचनोऽङ्गवृहद्वायैः शिलायैः क्रमात् ॥

Cakradatta, Svedādbikāra.

³ स्वेदश्चतुर्तिंधः प्रोक्तसापोषस्वेदसंचितः ।
उपनाहो द्रवः स्वेदः स्वेदं वातार्त्तिहारिणः ।
तापस्वेद उष्मस्वेदश्च ताप्यां संचितः ।

Bhava Prokāśa, I. i.

⁴ स्वेदः सप्तविवः प्रोक्तो लोटस्वेदो वृष्ट्यर्वदोऽग्निज्वालास्वेदः ।
घटस्वेदो जलस्वेदो फलस्वेदो वालुकास्वेदञ्च ।

Hāritā Samhitā, V. iv.

BALANCE OR MĀNADĀNDĀ.

For weighing medicinal substances, the scales and balance are often mentioned. They mention a set of weights and measures to be used in weighing substances. Alberuni¹ describes the Hindu balance thus:—"The balance with which the Hindus weigh things, are *χαριστίωνές* of which the weights are immovable, whilst the scales move on certain marks and lines. Therefore the balance is called *tūla*. The first lines mark the unit of the weight from 1 to 5, and further on to 10; the following lines mean the tenths, 10, 20, 30, &c. In Fergusson's Tree and Serpent Worship we have a diagram of steel-yard, where a man is represented as stepping in the scale, apparently to weigh himself². The ordinary balance is still in common use amongst the kavirājes of the present day.

COLLYRIUM POTS.

The Hindus used to apply collyrium to their eyes, from a very early time. It is said to stimulate the growth of eye-lashes, brighten the lustre of the eye-balls and clean the pupil³.

Bhāvainiśra⁴ recommends us to use collyrium as it improves the visual power and cures many diseases of the eye. It is

¹ Alberuni's India. Trans, by Sachau, vol. I, p. 146.

² The Tree and Serpent Worship, the pl. lxxxiii, fig. 1.

³ पञ्चलं विशदं कालममलोच्चल मण्डलं ॥

नवमञ्जन संयोगादभवेच्चामल तारकं ।

Suśruti Saṅhitā, IV. xxiv.

⁴ सौवीरमञ्जनं नित्यं हितमञ्जास्तो भजेत् ।

लोचने भवतस्तेन भनोजं सूक्ष्मदर्शने ॥

“सौवीरं” चेत् सुरमा-इति लोके प्रसिद्धम् ।

स्त्रोतोऽञ्जनं भते चेष्टं विशुद्धं मिञ्चुसम्बवम् ॥

contra-indicated in patients suffering from fever, emesis, exhaustion, &c.

Suśruta mentions collyrium pots of different metals intended for different kinds of collyrium then in use—

gold	pots	for	sweet	collyrium.
silver	pots	for	acid	collyrium.
horn	pots	for	salt	collyrium.
copper & iron	pots	for	astringent	collyrium.
lapis lazuli	pots	for	sour or acid	collyrium.
bell-metal	pots	for	bitter	collyrium.

He also mentions pots of ivory, or crystal, or coral, or horn, or conch-shell, or stone, or gold, or silver¹.

He also mentions a piece of bamboo for storing collyrium². A bamboo is still used by the poor for keeping oil in India. For a similar purpose the wood of Khadira (Accacia Catechu) is also

द्विष्टः कण्डूनलहरं दाहक्केद् रुजापहम् ।

अच्छारुपात्रहच्चैव सहनेमारुतातपौ ॥

नेवेरोगा न जायन्ते तस्मादञ्जन माचरेत् ।

“श्रीतोऽञ्जनं” क्षाणसुरमा इति लोके प्रसिद्धं ॥ “विशुद्ध” शोधनं विनापि ।

“सिञ्चुसम्भवम्” सिञ्चुनाम पर्वतस्त्र उभवम् ।

रात्रौ जागरितः शान्तः कृदितो भुक्तवांस्था ।

ज्वरातुरः शिरम्बातो नाक्षीरञ्जनमाचरेत् ।

Bhāva Prokāśa, I. i.

¹ See foot-note 3, P. 67.

² कञ्जकाशोकशान्दामपियङ्गनलिनोत्पलैः ॥

पुष्पैर्देणुक्षणाह्रापथ्यामलकं संयुतेः ।

सर्पिर्मध्युतैश्चूर्णवण्णनाडामवस्थितैः ॥

recommended¹. For storing oil, Dr̄ghavala² mentions the use of vessels of stone or the horn of a lamb or iron.

MEDICINE GLASS.

Sukti or shell of mussell was used as medicine glass. The shell of the fresh water mussels unionacea is mentioned to be used for holding a dose of medicine for administering it to a patient³. They generally have equivalve, though not equisided, shells which are covered externally with a smooth brown epidermis and internally by a mother-of-pearl layer. Such a shell “is said to have been formerly much used in England by painters for holding their colour and so the commonest variety is termed unio pectorua. To apply oleaginous errhines, Suśruta⁴ recommends us to use metallic pots or the shell of mussel. It is still used in India for feeding the babies with milk and also for administering medicines to the patient. Heyne⁵ (1814) says that “according to the nature of the disender, the medicines should be taken out of gold, silver or brass vessels. But if these should not be at hand you may use iron or even earthen vessel.”

१ मैस्ववोपहितं युज्जान्निहितं विणग्न्हरे ।
मिदोयकदष्टतचाजं पिप्ल्यः सेस्वं मधु ॥
रसमामलकच्चापि पक्तं सम्यडः निधापयेत् ।
कीर्णि खदिरनिर्द्धाणि तद्वत् लद्राङ्गनं हितं ॥

Suśruta Saṁhitā, VI. xvii.

² See foot note, 4, P. 67.

³ तत उपसम्भूतशरीरः प्रातः प्रातरुत्थाय पाणिशुद्धिमात्रं चौदेण प्रतिसंसज्जोपयुज्ञीत ।
Suśruta Saṁhitā, IV. x.

⁴ वामहस्त प्रदेशिन्य योन्नासितनालायाय विशुद्ध सोतसि दक्षिण हस्तेन स्वेहसुष्णानु तस्म रजत सुवर्णं तासमृत्पाव शुक्रिनामन्यतम यं शुक्रा पिचुना वा मुखोष्णं स्वेहसुष्णानु तस्म व्यवच्छिन्न-धारं यथानिवेन प्राप्नोति ।

Ibid. IV. xl.

⁵ Dr. Heyne's Indian Tracts,

DROPPER.

The Hindus used a tent of cotton as a drop conductor. Cakradatta¹ advises us to drop medicines into the eyes thus:—the patient should be made to lie down in a place free from draught; the surgeon is to open his eye with the left hand, while with the right, he allows 10 or 12 drops of medicine to fall from a height of two anguli on the eye from a tent of cotton, immersed in medieine contained in a clean vessel.

GRIND-STONE.

Grind-stone to pulverise medicaments is mentioned. In the Mahāvagga² we find a reference to it. “I allow, O Bhikkhus, the use of a grind stone, and of another stone to grind upon” (pisana-śilā ka pisana poto ka—Buddhaghosha).

STONE AND IRON MULLER.

For similar purpose a stone slab and iron muller are necessary to make pastes and powders of medicines. On the inner face of the left pillar in the eastern gate of Sanchi Topes, the kitchen scene is represented, in which “a fourth woman is seated grinding spices or condiments on the sil, or flat stone, with a bant or round muller³”.

KHAL OR ELLIPTICAL MORTAR OF STONE AND PESTLE.

To prepare medicines to be exhibited to the patients, a small

¹ निवातस्य वाभेन पाणिनीन्मील्य लोचनम् ।

युक्तौप्रलभ्यत्वान्वेन पितृवर्च्या कनीनिके ।

दण्डादण्डं वा विन्दून् द्राहुलादवसेचयेत् ।

Cakradatta, Āśotaneyāñfann Adhikāra.

² Mahāvagga vi. 3.2.

³ Cunningham Cunningham's Bhilsa Topes, p. 206.

elliptical mortar is generally used when the medicines require to be thoroughly mixed with some excipient.

The following appliances, besides those mentioned before, become necessary in pharmacy :—

1. Iron pails of various sizes.
2. Vessels of iron, copper, silver, brass and earth for storing medicines.
3. Spoons of wood or darvi; large metallic spoon or hata.
4. Iron sandamśa or pinchers.
5. Rods of wood or iron.
6. Blacksmith's bellows.
7. Ankuśa or hooks like the elephant driver's goad.
8. Iron hammer.
9. Earthen crucibles of different sizes.

CHAPTER IX.

THE CONCLUSION.

In the recent edition of the System of Medicine, Prof. Albutt¹ begins his article on the History of medicine with the following observations : "The medicine of Egypt and the East, extensive and intricate as it was, in so far as it was not Greek did not contain even the rudiments of science. To it Western medicine owes virtually nothing, and in this article at any rate, it may be disregarded". Prof. Osler² also speaks in the same strain : "Crude and bizarre among the primitive nations, these ideas of disease received among the Greeks and Romans a practical development worthy of these peoples. There have been systemes of so-called divine healing in all the great civilizations, but for beauty of conception and for grandeur of detail in the execution, all are as nothing in comparison with the cult of the son of Appolo, and of Æsculapius, the god of healing." "Scientific medicine, the product of a union of religion with philosophy, had its origin in a remarkable conjunction of gifts and conditions among the Greeks in the sixth centuries".

Such opinions remind us of an assertion of Sir William Jones³ "that there is no evidence that in any language of Asia there exists one original treatise on medicine considered as science". About a century has elapsed since the time of Sir William but we see that the same misconception still prevails in the minds of

¹ Albutt and Rolleston. System of Medicine, vol. I, p. 1.

² Osler and Mcrae's System of Medicine.

³ Discourse xi. Sir William Jone's Works, Vol. I. p. 161.

the scholars. Macdonell¹ gives us a succinct account of the intellectual debt of Europe to the various branches of science and art of the Hindus but regrets that the genetic connection of Indian medicine with that of Greece can not at present be definitely settled. "The question as to whether Indian medical science in its earlier period was affected by that of the Greeks can not be answered with certainty, the two systems not having hitherto been compared with sufficient care." The European mind is quite naturally in the habit of tracing all knowledge to Greece, the fountain of all their knowledge in philosophy and science. But impartial writers are not wanting to vindicate the claims of the Hindus. So Wise remarks as follows² :—"Facts regarding the ancient history of medicine have been sought for only in the classical authors of Greece and Rome and have been arranged to suit a traditional theory which repudiated all systems which did not proceed from a Greekian source. We are familiar from our youth with classical history and love to recall events illustrated by the torch of genius and depicted on our memories ; and it requires a thorough examination of a subject, a careful weighing of new evidence, and a degree of ingenuousness not always to be found to alter early impressions. Still candour and truth require us to examine the value of new facts in history as they are discovered, so as to arrive at just conclusions". Royle maintains³ that "from the mixture, however, of much ignorance and absurdity with what is valuable, many will be apt to despise altogether the medicine of the East. But if it be recollected how long in Europe prevailed the influence of Galen,

¹ History of Sanskrit Literature, ch. xvi.

² Review of the History of Medicine. Introduction.

³ Antiquity of Hindu Medicine, p. 61.

as well as how many absurd formulas still figure in some continental pharmacopœas, as also how comparatively recent is the time since our own was so greatly improved; some feeling of humiliation will control the pride with which we now view the medical sciences". Neuberger says¹; "The medicine of the Indians, if it does not equal the best achievements of their race, at least nearly approaches them. and owing to its wealth of knowledge, depth of speculation and systematic construction, takes an outstanding position in the history of oriental medicine." It is no doubt unsatisfactory to find that such notions are still allowed to stand in the way of impartial conclusions by eminent men of science especially by those who write history of medicine. But it is not the fault of the historians alone, the fault lies with us for not having supplied them with adequate materials. Something has been done in this field of research by men like Wilson, Heyne, Ainsle, Royle, Dutt, Thacore Shaheb, Jolley, Hoernle and others, but it is nothing when compared to what is required to be done. To supply this want partially, we have endeavoured in this monograph to describe the surgical instruments of the Hindus, with a comparative study of the instruments of the Greek, Roman and Arab surgeons, and of the surgeons in modern times. By a careful study of this subject, we can not avoid the conclusion that the medicine of India though it was not Greek, contained the requirements of science and has a fair claim to be considered in the history of medicine. To it western medicine really owes something and so the subject has been studied and investigated thoroughly.

¹ Neuberger. History of Medicine. Trans. by Playfair. Vol. I. p. 437.

Apart from the usefulness of the study for collecting materials for the history of medicine, there are good reasons for a critical examination of the subject. The knowledge of the Hindus in medical science was by no means rudimentary. There is evidence to show that they were inferior to none in the quality or quantity of the knowledge of the science at that early age. Hoernle says:¹ “Its extent and accuracy are surprising when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition.” They practised dissection of human bodies and their anatomical studies have the mark of high order. “We have seen that they used various forms of surgical instruments. The Hindus cut for stone couched for the cataract and extracted the foetus from the womb”. They performed abdominal section, practised cranial surgery successfully and no region of the body was thought sacred to the knife. They repaired nose and ears by plastic operations, treated fractures and reduced dislocations, and were experts in performing amputations. They reduced hernia, cured piles and fistula-in-ano by surgical technique, and inoculated and vaccinated for small-pox. Field surgery was thoroughly understood and arrows were extracted with skill. They were acquainted with the circulation of the blood,²

¹ Hoernle's Osteology, Preface. P. iii.

² याभिरिदं शरीरमाराम इव जलहारिणीमिः केदार इव च कूल्याभिरपत्रिहते-
ऽनुग्रहतेचाकुच्चन प्रसारणादिमिर्लिङ्गेषैः। द्रुमपवसेवनीनामिव च तासां प्रतानास्तासां
नाभिर्मूलं ततश्च प्रसरन्वृद्धिमध्यक्षिर्यक् च।

Suśruta Saṁhitā, III. vii.

देहस्थोत्पत्तिरसजो देहस्तेव धार्यते ।
रक्तं जीवस्य चाधारस्त्वादचेदस्तग्वुधः ॥

the distinction between the artery and vein,¹ the use of anaesthetics, the means of arresting haemorrhage and the proper treatment of surgical wounds. They enumerated 107 vital parts of the body to be avoided, if possible, by the surgeon in practising his handicraft.²

In medicine they first propounded the humoral pathology. Though it seems fanciful in the light of modern culture, it must be admitted that no other theory has been attempted to explain the causation of disease in recent times. "They were the first nation who employed minerals internally and to them we owe the therapeutic use of mercury and arsenic in intermittents". They introduced massage, postural treatment and magnet in therapeutics. They excelled in chemistry and contrived many instruments for the preparation of chemical compounds. Atomic theory was discovered by Kanāda; and "they knew how to prepare sulphuric acid, nitric acid and muriatic acid, the oxide of copper, iron, lead (of which they had both the red oxide and litharge),

विस्ता द्रवता रागश्वलं विलयस्थथा ।
भूम्यादिपञ्चभूतानामेते रक्ते गुणाः स्मृताः ॥
रक्ते दुष्टे भवेच्छीयो रक्तमण्डलमेव च ।
व्यथा दाहश्च पाकश्च कण्ठूच्च पीड़कोद्धनः ।
हृद्दे रक्ताङ्गं नेत्रलं शिराणां पूर्णता तथा ।
गावाणां गौरवं निद्रा मेहो दाहश्च जायते ॥

Sāringadharā Saṅgraha, III. xii.
Bhāva Prakāśa, I. ii.

¹ इन्द्रियोपप्रभं ज्ञेयं प्रकृतिस्थसमंहतम् ।

Sāringadharā Saṅgraha, III. xii.

गृद्धाः समस्थिताः खिरधा रोहिन्यः शुद्धशोणितम् ।

² सुप्तोक्तरं मर्मशतं ।

Aṣṭāṅga Hṛdaya Saṅhitā, II. iii.

Suśruta Saṅhitā, III. vi.

tin, and zinc ; the sulphuret of iron, copper, mercury, antimony and arsenic ; the sulphate of copper, zinc and iron ; and carbonates of lead and iron¹. The processes of solution, calcination and distillation were discovered by them.

They understood the action of drugs and no less than 500 classes of medicinal agents are enumerated and arranged according to their virtues in curing diseases, and their remedial agents have been collected from the vegetable, animal and mineral kingdoms. There are 41 different forms in which the medicaments may be exhibited to the patient. We have the earliest notice respecting zoology and botanical geography in their works. They had a complete nomenclature of diseases which are described minutely as regards their ætiology, symptomatology, diagnosis, pathology, prognosis and treatment.

Veterinary science was well known to them, and treatises on horses and elephants—Aśvavaidyaka and Pālakāpya² are still extant, and will repay perusal. Even there is a treatise on the treatment of plants and trees³. Thus we see that the Hindu medical science must not be condemned offhand and requires a careful and sympathetic research by scholars, before it can be excluded from the history of the science.

But I must be careful not to allow my enthusiast admiration carry me too far. It is quite true that the Ayurvedic system has its faults. It has been remarked that "it consisted of erroneous

¹ Elphinstone's History of India, 8th ed. p. 160.

² Another book on the medicine of elephants is quoted by Alberuni. See Sachau's Preface to Indica, p. xl.

³ For the bibliography of the Ayurvedic books, see my work "Materials, Biographical and Bibliographical, for the History of Hindu Medicine". (In the press).

doctrines founded upon a most fanciful anatomy, physiology and pathology. Much indeed could hardly be expected of a science based upon an anatomy which taught that the navel "constituted a centre from which a vascular system, including 40 principal vessels originated¹; upon a physiology which declared that these vessels were destined to convey blood, air, bile and phlegm to all parts of the body, and upon a pathology which maintained that disease depended either upon derangements of one or more of these humours or "upon the influence of good or evil spirits".² It must however be remembered that this criticism refers to a theory elaborated some 3000 years before. The idea that the navel formed the centre of the vascular system apparently had its origin in the foetal circulation³. The position of the heart was well-known and its function as a propelling organ is

¹ यावत्यस्तु सिराः काये सम्बन्धि श्रीरिणां ।

नाभ्यां सर्वा निवद्वास्ताः प्रतन्वन्ति समन्ततः ॥

नाभिस्थाः प्राणिनां प्राणाः प्राणानाभिर्वृपाश्रिता ।

सिराभिराहता नाभिश्क्रन्ताभिरिवारकैः ॥

तासां मूलसिराश्वारिंश्चासां वातवाहिन्यो दश पित्तवाहिन्यो दश कफवाहिन्यो दश दश रक्तवाहिन्यः ।

Suśruta Saṃhitā, III. vii.

तस्यान्तरेण नाभेष्टु ज्योतिःस्थानं ध्रुवं सूर्यं ।

तदा धर्मति वातस्तु देहसेनास्य वईते ॥

Ibid. III. iv.

² A course of lectures on the Principles and Practice of Medicine delivered at Calcutta Medical College. By Francis. 1868.

³ मातुस्तु खलु रसवहायां नाड्यां गर्भनाभिनाड्यै प्रतिवद्वा सास्य मातुराहाररस-वीर्यमभिवहति । तेनोपस्थेहिनास्याभिर्दिर्भवति ।

Suśruta Saṃhitā, III. iii.

described in the ancient books¹. In the later Tantras the origin of the nerves from the spinal cord and the brain is distinctly stated². The ancient Hindus, like the Babylonians, thought the heart to be the seat of the understanding, and the liver as the central organ of the blood. The Greeks were the most cultured nation at that age, and the knowledge of the two nations can be compared to our advantage. The Hindus did not share with the Greeks the belief that the uterus is “an animal within an animal” and that it can be attracted by pleasant smells and repelled by pungent substances”³. The humoral pathology was also the keystone of the Greecian system. The belief in the good and evil spirit was the only alternative to the pathologists when the microscope and the germ theory of diseases were unknown. It is highly creditable to the classical Greek physicians for banishing superstition from the practice of the art; but we know that the later Greek writers Aetius, Alexander and Paulus, and the Latin medical literature, were not free from its baneful influence. The belief in charms and miracles in the cure of diseases seems to be universal and is

¹ स रसः इत्युच्चते । तस्य च हृदयं स्थानं स हृदयाच्चतुर्भिंश्तौः धमनीरनुप्रविश्योईगा दश दश चाधोगमिन्यश्चतस्तस्तिर्थगाः कृत्स्नं शरीरमहरहस्तर्पयति वर्डययि धारयति यापयति जीवयति चाहटहेतुकेन कर्मणा ।

Susruta Samhitā, I. xiv.

² हे हे तिर्थक्गते नाडौ चतुर्भिंश्ति संख्या ।

मेरुदण्डस्थिताः सब्बे सूते मणिगणाऽव ॥

* * * *

जल्यमूलमधःशाखं छचाकारं कलेवरं ।

यथाश्वत्यदले तदत् शरीरे नाड़यस्थिताः ॥

Tantra.

³ Paulus Aegineta, Adam's Commentary, Vol. I. P. 636.

working even at the present time. Adams says¹ that "considering the faith which many educated persons now repose in the virtues of galvanic rings and garters, the present generation has little ground for laughing at the credulity of our forefathers, with respect to amulets and other phylacteries".

In later times, attempts have been made to substitute other theories in the place of the humoral, and we know with what results. "Paracelsus substituted an equally baseless hypothesis, that the fundamental element of the human body were three principles : sal, the solid element; quicksilver, the liquid; and sulphur, the aerial. This formula was the badge of the Paracelsist school up to the end of the 17th century." Sylvius and Willi (17th century) of the Iatro-chemical school "referred most diseases to morbid matters or "acrimonies" produced by perverted secretions, and these being sometimes too alkaline, sometimes too acid, the antithesis of acid and alkali became the badge or catch word" of their system. Friedrich Hoffman (1660-1742) constructed another system which "supposed life to be a universally diffused ether, which entering the animal body, became transformed in the brain into Pneuma or nervous fluid. "George Ernest Stahl (1660-1734) believed in the hypothesis of Animism, and "the symptoms of disease were regarded as the conscious efforts of the soul to overcome the morbid influences". William Cullen (1712-90) "propounded a new system of medicine, intended to reconcile the opposing views of his predecessors. Its main feature was the importance attached to the nervous system in the causation of disease." Lastly the "Brunonian" system of John Brown, based on

¹ Adam's Commentary on Paul.

the doctrine of stimulus, and Hahneman's theory of homœopathy need be mentioned here to complete the list.¹ Thus we see that even some of the eminent men of science indulged in fanciful theories in quite modern times.

The study of ancient Hindu medicine has an antiquarian value. It is perhaps the oldest system of medical science still extant. Fragments of Egyptian and Assyrian medicine have no doubt been unearthed. But these cannot be compared with the complete system of the medical science as preserved in the early Sanskrit works on the subject. The Hindus believe their science of medicine to be of divine origin and this belief is founded upon the fact that the existence of the medical profession can be traced back to prehistoric times. The humoural theory is mentioned in the Rgveda² which according to the consensus of opinions amongst the European savants can not be later than 2000 B.C., and possibly earlier. The Buddhists relate a story, how, in one of his former births, Buddha was born as a medicine-man. "In the Mahosadha birth the archangel Sakka came to him as he was being born, and placing some fine sandal-wood in his hand, went away. He came out from the womb holding this in his fist. His mother asked him "What is it you hold, dear, as you come?" He answered "Medicine, mother!" So because he came holding medicine, they gave him the name of medicine-child (oṣadhadhāraka). Taking the medicine they kept it in a chatty (an earthenware water-pot) and it became

¹ Medicine in modern Europe. Payne in Albutt's System of Medicine, vol. I, p. 26, 29, 34.

² चोमानं श्रयोर्भूमकाय सूरवे विधातु शर्म वहतं शुभस्यती ॥

Rgveda, i. 84, 6.

a drug by which all the sickness of the blind and deaf and others as many as came, was healed—so the saying sprang up, “This is a powerful drug”; and hence he was called Mahosadha (The great medicine-man).¹ This early date of the science amongst the Hindus is not exceptional. It is now well-known that so severe an operation as trephining the skull was often performed in the early stone age. “Trephined skulls from neolithic period have been found in most European countries, in Algiers, the Canaries, North America, Mexico, Peru and the Argentine”². In the Code of Hammurabi, king of Babylon (2285-2242 B. C.), there are thirteen articles regulating medical practice. One deals with the responsibilities of a surgeon performing operations on the eye. The laws Hammurabi lay down that:—

“If a Physician cause a severe operation wound with a bronze operating knife and cure the patient, or if he open a tumour (cavity) with a bronze operating knife and save his eye, he shall have ten shckels of silver.

“If it be a freedman, he shall have five shekels.

“If it be any one’s slave, his owner shall give the physician two shekels of silver.

“If the physician make a severe wound with a bronze operating knife and the patient die, or if he open a growth with a bronze operating knife and the patient lose his eye, he shall have his hands cut off.

“If a physician make a severe wound on the person of

¹ Rhys David’s Buddhist Birth Stories, vol. I, p. 67-68.

² Neubergor’s History of Medicine, P. 3.

a slave belonging to a freed man with the bronze operating knife and kill him, he shall replace the slave by another slave.

"If a physieian heal a broken bone or eure diseased bowels, the patient shall pay the physian five shekels of silver."¹

Homer pays tribute to Egypt for her

"Patron-god imparts
To all the Pharian race his healing arts."

Herodotus says that the Egyptian physieians were specialists of particular diseases, and Clement of Alexandria mentions forty-two Hermetic books on medieine by the god Thot.

"According to Manetho, he (Teta) constructed the Royal castle of Memphis and wrote a work on anatomy² being particulearly occupied with medicine. The latter supposition is rendered more complete to a certain extent by the account, due to Ebers Papyrus³, that the method of making the hair grow, described accurately therein, was supposed to have been discovered by our king's mother, Shesh."⁴ Teta was the second king of the first dynasty of the old Memphis kingdom and flourished in 4366 B. C. King Senta of the seeond dynasty owned a medieal work which belonged to Semti or Hesepeti (4266 B. C.), the 5th king of the first dynasty.⁵ "Tosorthros of the third dynasty, was said to have composed a treatise on medicine,⁶ a fact whielh

¹ Neuberger. History of Medicine, P. 18.

² Manetho, in Müller-Didot, Fragmenta Historicum Græc, vol. II, pp. 539, 540.

³ Ebers Papyrus, Pl. lxvi, 1, 5.

⁴ Historian's History of the World, vol. I, Egypt and Mesopotamia. p. 91.

⁵ Ibid, p. 68.

⁶ Manetho, etc., vol. II, p. 544.

caused him to be identified with the healing god Imhotpû."¹ These facts suggest a great age for Egyptian medicine. Medicine flourished among the Assyrians: "Fragments of an old work on medicine have been found, which show that all known diseases have been classified and their symptoms described; and the medical mixtures considered appropriate to each being compounded and prescribed quite in modern fashion."²

The oldest medical treatise extant amongst the Chinese is the Neiching, the authorship being attributed to Hwang-ti; it dates back to B. C. 2597. Mr. Gatzlaff,³ missionary in China, has given us a short view of a celebrated work, in 40 volumes, on Chinese medicines, which is called Ching che chun ching *i. e.*, "Approved marking line of medical practice"⁴ So the Hippocratic treatises (460 B. C.) are rather modern compilations compared to these ancient books; and as told by Plato, the priest of Sais was fully justified when he addressed to Solon: "You Greeks, you are but children."⁵

It will be seen again that a comparative study of the science discloses remarkable affinity to the systems of the other contemporary nations. The fabulous origin of medicine in India and Greece can not fail to attract the notice of even a casual observer. The resemblance of Dakṣa, the preceptor of the two Aśvins, the offspring of Sun, who after learning the

¹ Ibid, p. 544 and 545.

Quoted in Maspero's "The Dawn of Civilization." Edited by Prof. Sayce, 5th ed. p. 238.

² Assyria; its Princes, Priests and Peoples, Sayce, p. 119.

³ Proceedings of the Asiatic Society, Part VII, p. 154.

⁴ Royle. Antiquity of Hindu Medicine, p. 67.

⁵ Timæus, p. 22.

Āyurveda from their father became the medical attendants of the gods, to Aesculapius—the reputed son of Apollo, and his two sons Machaon and Podalarius, celebrated in the Homeric poems, is indeed remarkable. More remarkable is the belief in humoural pathology shared by the two nations, separated from each other by continents and seas, and alienated from each other by the differences in customs, manners and religion. The theory of independent origin and development falls to the ground, especially when we consider the strange coincidence in the surgical instruments used by the two nations in performing surgical operations. Some of the instruments used by the Hindus were not only identical in structure and shape to the instruments of the Greeks, but they had even the same name. Thus for instance, the alābu yantra of the Hindus corresponds to the description of the eucurbitula of the Greeks, and both the terms mean a gourd. A śringa is the horn; aṅguli yantra or mudrikā is the finger or ring-knife; yoni-vraṇekṣana is the diopter or vaginal speculum; aṅkuśa is the hook; &c. Some instruments though they have different names are identical in structure and uses. Thus, the Scammum Hippocraticum or the Plinthium Nelei is the Greek counterpart of the Hindu kapātaśayana; the lithotomy binding of the yantraśatakam; the clyster of the vastiyantra; the saw of the karapatra; the needle of the sūcī; &c. Again many surgical operations are similarly described in both the systems, as for examples, the operations for stone and cataract may be cited. In the description of diseases, passages occur in books which seem to be a literal translation of one from the other. Thus in describing the symptoms of hydrophobia, Paulus quotes Rufus who pronounces it to be a

species of melancholy and then observes "Which reason accords also with those who say that they think they saw the image of the dog that bit them in water". The word "those" in the above sentence becomes clear to us when we read a similar passage in the kalpasthāna of the Suśruta Saṃhitā, and it may be thus translated:¹ "If the patient sees the image of the animal that bit him in the water or mirror, he is sure to die." Other passages might be multiplied but our limited space forbids any further quotations. All these coincidences can scarcely be accidental; and though we may not be able to trace the actual progress of medicine from India to Greece, yet the evidence in favour of its transmission is too strong to be held in doubt.

Thus the question of the relation of the medical science of the Hindus to that of the Greeks naturally suggests itself for solution. The possibility of a dependence of the either on the other can not be dismissed offhand for we have historical evidence of communication between the two nations at a very early age. We need not dwell at length upon those shoals and quagmires of historical controversies, the alleged conquest of India by Egyptian Seostris as recorded by Diodorus Seculus² in prehistoric times; the connection of the Phoenician traders as proved by the articles of merchandise,—cinnamon, aloes, onyx, agate, ebony, tin and ivory³ diamond, gold and

¹ अप्तुवा यदिवादर्शं रिष्टं तस्य विनिर्दिशेत् ॥

वस्त्यकम्माद् योऽभीक्ष्य श्रत्वाहटापि वा जलं ।

जलदासन्तुविद्यात् रिष्टं तमापिकौर्तिंतं ॥

Suśruta Saṃhitā, V. vi.

² I. ib. I. ch. 43. Nolan.

³ Strabo. xv 37. [Quotes Megasthenes; Theophrastus quoted by MacCrindle in Ancient India as described by classical authors, p. 46; Virgil. Georg. 11. 116-17 ("India alone produces black ebony"), Georg. 1. 57.. ("India sends Ivory"), Lonsdale and Lee's trans.; Horace, odes 1. 31.

embroidered work¹ the eommereial enterprises of the ships of Solomon (992 B. C.) from Ezion-Gaber² under the guidance of the mariners of Hiram (B.C. 980-917) which brought back the gold of "ophir," its almug trees and ivory, apes and peacock; the possibility of an Indo-Hellenic intercourse to explain the remarkable coincidences between the systems of philosophy current amongst the two nations, and which culminated in the bold theory of Poeocke³ that Pythagoras, who is generally considered to be the founder of the healing art amongst the Greeks⁴ was an adaptation of the Buddhugurus, and the assertion that Greece must have been an Indian colony before. Let us rather tread on firmer grounds and we know that two Greek physieians, Ktesias (about 400 B.C.) and Megasthenes (300 B. C.) visited Northern India. Ktesias in his Indica mentions the coehineal plant, its worm and dyes, monkeys, elephant and parrot. He says that the Indians were free from headache, toothache or ophthalmia and from mouth sores or ulcers. Alexander the Great (B.C.327), so says Nearchus, employed some Hindu vaids in his camp in India to consult them in cases of snake-bites and other dangerous ailments. Megasthenes mentions ebony as growing in Bengal, and tiger, monkey and elephants are also alluded to. Strabbo mentions that Daimaeus was sent to the court of Candragupta's son, but unfortunately the book he wrote about India is lost to us. Mention also should be made of the intereourse of Egypt with India under the Ptolemies and we know, that Ptolemy

¹ Birdwood's Industrial Arts of India, pp. 263-4.

² I. King. ix. 27 ; xii, p. 22.

³ India in Greece.

⁴ See the Origin and Growth of the Healing Art—Beddoe. 162.

Philadelphous sent an embassy headed by one Dionysos to the court of Pātaliputra. Another source of dissemination of Hindu learning over the Western world is the emigration of the Buddhist missionaries to the kingdoms of Ptolemies and Greek kings as proved by the edicts of Aśoka. "And the Greek Simnoi (venerable) were no other than the Buddhist sramanas (these simnoi whom Clement of Alexandria has narrated to have rendered worship to a pyramid originally dedicated to the relies of a god, were the Buddhist Arhats (venerable) sramanas).¹ The intercourse of the East and West after the Christian era is well known and will not supply us with any proof as to the indebtedness of the Greeks and Hindus to each other; though "Dietz proves that the late Greek physicians were acquainted with the mediæval works of the Hindus, and availed themselves of their medicaments"; but he more particularly shows that the Arabians were familiar with them, and extolled the healing art as practised by the Indians, quite as much as that in use among the Greeks.²

But what is more important to us as a proof of the influence of the Indian medical science upon the Greecian system is the identification of drugs of Indian origin in the meteria medica of the Greeks. For instance the Sacred Bean of Pythagoras has been identified with Utpalam or Indian Nelumbium.³ Hippocrates the Great, who was eontemporary and kinsman of Ktesias⁴ the court physieian to the king of Persia, mentions:—Sesamum Indicum (Tila); Nardostachys Jatamansi

¹ Lalitvistara. Mitter's ed. ch. 1.

² Journal of Education, Vol. viii, p. 176.

³ Pratt's Flowering Plants, Vol. I, p. 67.

⁴ Galen; Comment, in libr. de artic. iii.

(*Jatāmāīnsī*); Beswillia Thurifera (Kunduru); Zinziber Officinale (*Śringavera*); and Piper Nigrum (Marīei). Dioseorides (1st century A.D.) in his *Materia Medica* describes:—Agallochum, Eellium, Ebony (*Diosphynos Ebenaster*), Ammomum zinziperis (Ginger), Calamus aromaticus (sweet cane of Scripture), Eletteria Cardamomum (*Elaci*), Lyeium Indicum or Russot, the product of Berbera lyeium, Atramentum (Indigo), Onyx or the opereulum of an Indian shell-fish, etc. In later times, we find Aetius, an Alexandrian writer of the 5th century describing Indian nuts, sandal wood, cocoanuts, etc. Symon Set mentions camphor; and Paulus Aegineta (7th century A.D.), a writer well known for his judicious condensation of the Greek medical literature, mentions Aloes, Cantharides (*Mylabris Cichory*), Cloves (*Caryophyllum Aromaticus*), Millet (*Panicium Halieum*), Costos (root of *Auklandia Costos*), Cassia (*Cinnamomum Cassia*), Indian stones as amulets, Malabathri or *tejpāt* (*Laurus Cassia*), Ambar, etc.

Now let us reproduce some of the conclusions arrived at by Western scholars as the result of the controversy. As regards philosophy, Colebrooke¹ asserts that “the Hindus were teachers and not learners”. Cunningham² says: “Indians have the advantage in point of time; and I feel satisfied that the Greeks borrowed much of their philosophy from the East” Weber³ remarks that “there is no ground whatever to suppose that Suśruta borrowed his system of medicine from the Greeks, on the contrary there is much to tell against such an idea”.

¹ Transactions of the Royal Asiatic Society, vol. I.

² Bhilsa Topes, pp. 32-33.

³ History of Indian Literature.

Prof. Diaz of the Konnigsberg University, detects the principles of Indian medicine in the medical literature of the Greeks". "It is to the Hindus" says Wise, "we owe the first system of medicine." Royle has proved beyond doubt the indebtedness of the Greeks and Arabs to the Hindus. Haas's theory that Suśruta is the Indian adaptation of the Arabic name of Suqrat or Buqrat, the Arabic corruption of the Greek Hippocrates, and that Kāsi is an adaptation of the Island of Cos has been deservedly condemned as "an elaborate joke". Neuberger says:¹— "The similarity between Indian and Greek medicine of the period is in its outline and in certain details so striking that it is hardly surprising that the originality of the former has frequently been questioned or even denied. The more so is this true since the dates of the more important Indian works are fixed with the greatest difficulty, and before the discovery of the most recent manuscripts they were quite indefinite."

In consideration of the outstanding independent achievements of the Indians in most branches of science and art, and of their aversion from foreign influences, the trend of opinion to-day, informed by recent discoveries is in favour of the originality of Indian medicine in its most salient features."

Another fact must here be pointed out that the Hindus always acknowledged any help they might have received from other nations for the development of their science. The striking proof of this is found with reference to the science of astronomy—the only branch of learning which seems to have been influenced by the Greeks. Varāhamihira compiled his famous Pañcasiddhāntica or the collection of the five old treatises on astronomy,

¹ Neuberger. History of medicine, Vol. I, p. 45.

viz., Paulisa, Romaka, Vaśiṣṭha, Saura, and Paitamoha. Both Weber and Kern have no doubt that Paulisa was a Greek and the name Romaka speaks for itself. But in the Hindu medical literature there is no mention of any foreign help, and the Indian medical treatises do not contain a single technical term which points to a foreign origin. It is interesting to quote the well known passage of Garga: "The Yavanas (Greeks) are Mleechas, but amongst them the science (astrology) is well established. Therefore they are honoured as Rsis—how much more than an astrologer who is a Brāhmaṇi". It is a standing monument of the catholic spirit of the Hindus, and they know no better way to show their respect for the learned men of the world. To this may well be contrasted the behaviour of the Greeks towards the other nations. The doctrines of Pythagoras are pre-eminently Indian¹, but that philosopher has not a word to speak of the Hindus. In astronomy the Greeks are indebted to Babylon: Ptolemy mentions that Hipparchus worked out and improved upon the astronomical computations of the Babylonians with reference to the moon; but recent discoveries from the clay tablets have shown that the figures ascribed to Hipparchus are merely copied from the numerical values worked out in Babylon. "The discovery of the precession of the equinoxes is generally ascribed to Hipparchus. It was he indeed, who brought this fact to the Greeks, and he estimated its yearly amount as from 36 to 39 seconds, but it is certain that he learned about it in Chaldea, and that he obtained the elements of his calculations from the astronomical observations made on the lower Euphrates".² Paulus Aegineta

¹ See Entfield's History of Philosophy.

² Historian's History of the World. Vol. I, p. 596.

gives us a complete system of operative surgery of the ancients. Celsus, in the last two books of his work, has treated of the surgical operations with considerable accuracy; and though the former availed himself of the labours of the latter, Celsus is never mentioned as one of the sources of informations used by Paulus who appears to have been wholly unacquainted with his works; and Adams remarks "but when did a Greek writer ever acknowledge himself under obligation to a Roman"?

But are we to suppose that the Greeks wilfully concealed the names of the Indian physicians in their books? Surely not. The Greeks might not have known the real source of the informations which they probably received second-hand. There is historical evidence of an intercommunication between Greece and Persia from the time of Ktesias or the 4th century B. C. to the 6th century A. D. We also know of a tradition that the services of the Great Hippocrates—a kinsman of Ktesias, were required in the Persian court, but he declined the invitation. Again we know that books on ancient sciences of India were possibly made use of by the Persians in early times, and to this intercommunication may be due "the coincidences which have been observed between the science of the Greeks and that of the Hindus" (Royle).

As regards the indebtedness of the Persians to Sanskrit literature, "we have positive testimony on the subject, as the Baron de Saey, in his account of the well-known Sanskrit origin of the Fables of Pilpay, states that these were first translated in Pehlevi during the reign of the Persian king Nooshirwan, who ascended the throne in 531, and died in 579 and who is reported by historians to have encouraged learning, and to have induced Greecian philosophy at his court. The translation

were made by the physician Barzonyeh who had brought the original from India with other books, and who by more than one previous journey to that country, had acquired a knowledge of Sanskrit. He is stated particularly, to have made two journeys, one for the purpose of procuring medicaments and herbs, and the other for obtaining specimens of literature of the Hindus”¹. “ Previous even to this (A. D. 330), we hear of the Persian king Bahram visiting, in disguise, the court of Basdeo, sovereign of Canouge, to study the laws, religion and manners of the Hindus.”²

But whatever differences of opinion there may be as regards the relation of the Greeks to the Hindoos, there is no doubt that the medical science of the Arabs was materially influenced by Hindu medicine. For we know that the medical treatises of Caraka, Suśruta and Mādhava were translated into Arabic in the beginning of the 8th century A. D., and the names of Scarac, Scirae or Xarac and Sarad occur in the Latin translations of Avicenna, Rhazes, and Serapion.³ Rāy dwells at length on the similarity of description of leeches as written by Suśruta and Rhazes. The modern medical science of the West is principally based on the Greek system as preserved in the books of the Arabian authors and so indirectly depends for some particulars at least upon the Indian system.

Sachau in his preface to Alberuni’s India⁴ remarks as

¹ Antiquity of Hindu Medicine, p. 168-69.

² Ibid, p. 73.

³ Rhazes : ‘ De Emblico,’ (Scarac Indianus), ‘ De Zinzibere, (Sarac) Serapion : ‘ De Myrobalanis’ (Xarch Indus), ‘ De Emblicis et bellericis (Xarcha Indus); Avicenna : ‘ Sub Emblico’ (Scirac Indum).

⁴ Alberuni’s India, Preface, p. xxx-xxxii.

follows :—" What India has contributed reached Bagdad by two different roads. Part has come directly in translations from the Sanskrit, part has travelled through Iran, having originally been translated from Sanskrit (Pali ? Prakrit ?) into Persian, and further from Persian into Arabie. In this way, *e.g.* the fables of Kalila and Dimna have been communicated to the Arabs, and a book on medicine probably the famous Caraka. *cf.* Fihrist p. 303 ". The Arabs also translated " Indian works on snakes (sarpavidyā), on poison (viśavidyā).....on the veterinary art¹.....But not only were the medical books translated into Arabic we have evidence that Indian doctors practised in foreign courts. Sachau continues :² " Another influx of Hindu learning took place under Harun (A. D. 786-808). The ministereal family Barmak, then at the zenith of their power, had come with the ruling dynasty from Balkh, where an ancestor of theirs had been an official in the Buddhistic temple Naubehar, *i. e.*, nava vihāra—the new temple (or monastery). The name Barmak is said to be of Indian descent, meaning paramaka, *i. e.*, the superior (abbot of the vihāra ?) *cf.* Kern, Geschichte des Buddhismus in Indien, ii. 445, 543. Of course, the Barmak family had been converted, but their contemporaries never thought much of their profession of Islam, nor regarded it as genuine. Induced probably by family traditions, they sent scholars to India, there to study medieine and pharmaeology. Besides, they engaged Hindu scholars to come to Bagdad, made them the chief physicians of their hospitals, and ordered them to translate from Sanskrit

¹ Alberuni's India, Preface, p. xxxiv.

² Ibid p. xxxii.

into Arabic, books on medicine, pharmacology, toxicology, philosophy, astrology, and other subjects. Still in later centuries, muslim scholars travelled for the same purpose as the emissaries of the Barmak, e.g., Almuwaffak, not long before Alberuni's time (*Codex Vindobonensis, sive medici Abn Mansur liber, fundamentorum pharmacologieæ*, Ed. Selignann, Vienna, 1859, pp. 6, 10, and 15, 9)."

"Harun-al-Rashid (786-809) had two Indians Manka and Saleh, as physicians at his court"¹ Manka translated the classical work on medicine, *Suśruta* (*cf.* Steinschneider, *Wissenschaftliche Blätter*, Vol. 1, p. 79) and a treatise on poison, ascribed to Kānakya, from Sanskrit into Persian (see Prof. Flügel, in *Zietschrift der D. M. G.* xi. 148 and s. 325). A Hebrew treatise on poison, ascribed to the Indian Zanik (Kanakya) is mentioned by Steinschneider *Wissenschaftliche Blätter*, Vol. 1, p. 65). Alberuni mentions an Indian Kankab as astrologer of Harun-al-Rashid (Reinaud, *mémoire sur l' Inde*, p. 315). He is likewise mentioned as a physician. Another Indian physician of Harun-al-Rashid is called Mankba (Reinaud). In the year 1381, a work on veterinary medicine ascribed to Salotar was translated from Sanskrit by the order of Firroz Shaha after the capture of Nagorecote. A copy of it was preserved in the Royal Library of Lucknow². Among the Hindu physicians of the time one ابن دهان is mentioned *i.e.*, the son of DHN, director of the hospital of the Barmaks in Bagdad. This may be Dhanya, or Dhanian chosen probably on account of its etymological relationship with the name *Dhanvantari* the name

¹ Prof. Dietz, quoted by Royle, p. 64.

² Maxmüller's *Science of Language*, Vol. I, p. 166.

of the mythic physician of the gods in Manu's law book and the epics (*cf.* A. Weber, *Indische Litteraturgeschichte*, pp. 284, 287). A similar relation seems to exist between the names Kanka, that of a physician of the same period, and Kankayana, an authority on Indian medicine (Weber l. c., pp. 287, note, and 284 note, 302). The name *جبل*, that of an author of a book on drinkables, may be identified with Atri, mentioned as a medical author by Weber, l. c. p. 288.¹

For informations on the Arabic translations of Sanskrit works, see *Analecta Medica* by Dietz; Wustendeld's *Geschichte der Arab Aerzte*; Cureton, "A collection of such passages relative to India as may occur in Arabie writers"; Wilson's note to the above in J. R. A. S. old series, vi, pp. 105-115. Pusehmann, p. 162; and Bedrœ, book iv. eh. 11. pp 286-299.

The Arabians added many durgs to the *materia medica* of the Greeks and amongst them we find the following Indian drugs described:—

Diudar or Pinus Deodara.....	Devadāru ²
Artemesia Indica.....	Nāgdamani.
Piper cubeba.....	Sugandha marica.
Cassia fistula.....	Suvarnakha.
Senna or Cassia obtata.....	Sonāmukhī.
Galangal or Alpina galangal, Roxb.....	Kulin-jana.
Ammomum grana paradisi.	
Macis.....	Mace.
Nux moschata.....	Nutmeg.

¹ Sachau. *Ibid* p. xxxii.

² It is described by Avicenna under its Sanskrit name, where he says that deiudar, "est ex genera abhel juniperus, que dicitur pinus Inda; et syri diudar est ejus lac" (Quoted by Royle).

Bdellium.....	Guggula.
Tamarindus Indica.....	Tintidī.
Trifolia.....	Triphala. ¹
Myrobalani.....	Haritaki.
Turpeth or Convolvulus Turpethum.....	Trivit.
Sel or Aegle marmelos.....	Vilva.
Santalum rubrum.....	Candana.
Melia azadirachta.....	Nimba.
Tembul (Piper betel).....	Tāmbūl.
Faufil (Arecha catechu).....	Khadira.
Nux vomica.....	Visamūsti.
Musa paradisiaca or plantain.....	Kadalī.
Moschos moschifera (from Thibet & India)	Mṛganābhi.
Dolichos lebleb.	
Orange or Citrus aurantium.....	Nāgaraṅga.
Limon or citrus medica.....	Mātulunga.
Pearls and other precious stones such as lapiz lazuli.	Borax, &c.
Rhabarburnum or Indian Rhubarb, etc.	

We can trace the Arabie and Greek names of some of the medicaments to a Sanskrit sourcee. Royle has discussed them at length, so we need give here only a synopsis of it:—

Triphalā (S)—Tryphalla (A)—Tryphalla (G)—Tryphalā parva (modern).

Devadāru (S)—Deiudar(A vicenna)—Deedara (G)—Pinus deodaru.

Tvaka-kshira (S)—Tabosheer (A).

Tamālpatra (S)—Malatroon or Malabathrum (G).

Tejapatra(s), or tuj—Sadej (A).

¹ Actuarius copies from Serapion and Mesue, the use of this medicine. The very name is Sanskrit, meaning the 3 myrobalans. Serapion refers to Xanth indus or Charak, in his De Myrobalani (Royle, P. 37).

Tāmbula (S)—Tumbol (P)—Tunbol (A).

Pippalī (S)—Pippul (H)—pilpil (P)—filfil (A)—(G)—piper (E).

Sṛṅgavera (S)—Shimgveez (P)—Zinzabil (A)—Zingiber (E).
Aguru (S)—aggur (H)—Agila (M)—Pao-d'aglia (aquilia)
(po)—Aod Hindee Agalloehum (G).

Candana (S)—chundan (H)—Shandana (T)—Sundul (P)—
Santal (E).

Kolinjana (S)—Galanga (G).

Vaca (S)—Wuz (A).

Dāvrusita (S)—Darcheeni (H)—Darsheeni (A).

Cacyn-nama (C)—Akimona (P)—Kaimanis (M)—Cinnamon.

Kuṣṭha (S)—Kooth (H)—Kust (A)—Koosrus (G)—
Koshta (Sy).

Abnus—Ebony (E).

Kubara (S)—pupal (P)—fufal (A).

Sajikā (S)—Sajiiamattee, sajiloon, sajii (H)—Sajimen vitri
(Geber)—Soza or soda (E).

Khar, khari (S)—Kali. (A).

Kussas, missy (India)—misy (A)—misy (G).

Tincana (borax)—Tinkar (P)—tineal (E).

Ambara (S)—Kharoba (A)—Amber, Ambegrise (E).

Kassis (tin)—Kassiteros (G).

Tuttha (S)—tootum or tutia (H)—tutia (P)—tatānagum
(T)—tutcnagun and tutty.

Manasilā (S)—Mansil (G).

Haritāl (S)—hartal.

Sarkarā (S)—sakkara (T)—sukkur (A)—Sugar (E).

Sandaracha (S) or sulphuret of arsenic—Zarnach (P & G).

Sphotaka (S)—phoska (B)—pocca (A. S.)—pocke (Ger).

Tintidi (S)—Tamar Hind (A)—Tamuarin (Fr)—Tamarinds (Italy & Sp.)—Tamarind (B)—Tamarindus India (L).

— Masurikā (S)—Masern (Ger)—Measles (E).

Vraṇa (S)—verole (Fr)—variola (L).

Danga (Hindus)—Dandy—Dengue (Sp).

S—Sanskrit. A—Arabic. G—Greek. T—Tamil. P—Persian. M—Malayan. Po—Portuguese. Sy—Syriac. Ger—German. A. S.—Anglo-Saxon. H—Hindi. E—English. B—Bengali. Fr—French. L—Tatin. It—Italy. Sp—Spanish.

Not only is the influence of the Sanskrit medical works detected in the Persian, Hebrew, Arabic, Greek and Roman works on medicine, there is evidence that the Hindu system of medicine was also adopted by the Tibetans and the Chinese. In the January No. 37 of the J.A.S.B. 1835 Vol. IV, an analysis of a Thibetan work is given by Alexander Csoma de Koros. It is called “rgyud bzhi” (the tract in 4 parts). It is attributed to Sakhyā. “In the time of Khrisroug Dehutsan (*i.e.* 8th or 9th century of the Christian era) a Tibetan interpreter Bairotsana (or Vairochana) having translated in Cashmere, with the assistance of physician-pandit (Davam Non-gah) presented it to the above mentioned Thibetan king.” In a Note on Thibetan surgical instruments, Walsh says:¹ “The present practice of surgery in Tibet is very simple, and, as already noted, consists chiefly of cupping, cauterizing, and bleeding. The Am-chhi informed me that the only instruments used are the cupping-bow (असुं
me-puñ, or मेसुन् me-bum, both meaning ‘fire vessel’), in which

¹ The Thibetan Anatomical System by E. H. C. Walsh in J. R. A. S. 1910,
pp. 1244-45.

paper is lit and the bowl is placed while hot over the part to be blistered; the sucking-horn (**ରେଷ୍ଟୁ** *r̥ib-ru*), by which cupping by vacuum is done; the cautery (**ଖୁଣସାମ୍** *khun-sa-me*), the lancet (**ର୍ତ୍ସା** *r̥tsa-u*), for bleeding, and a golden lancet (**ଶର୍କରୁତ୍ତୁ** *shar-kar-tt̥u* *gser kyi r̥tsa-u*) for operating on the eye.

In the journal of the Buddhist Text Society of Calcutta for 1894 three Tibetan block prints are illustrated, which contain representations of a large number of surgical instruments, some of them of an elaborate nature, including specula, saws, catheters, exploring needles, instruments for tapping hydrocele, and midwifery and other foreeps. The block-prints were brought by Rai Saratchandra Das, Bahadur, from Lhasa,¹ and a description of the figures was given by the late Lama Šes-rab MGya Mtsho, the Abbot of Ghoom Monastery, near Darjeeling, who was formerly physician to the late Tashi Lama, which were explained in a paper read by Dr. Saradaprasad Banerjee.²

If the elaborate and various instruments shown in the block-print were ever in general use they appear to have now ceased to be used."

In the J.R.A.S. April 1907, is mentioned "a Chinese text corresponding to a part of the Bower manuscript" by Watanbe. The identified portion of the MSS. consists of the six leaves which appear in plates XLIX-LIV (Hoernle's ed). The corresponding Chinese text is contained in six translations of which the following three, correspond completely to the MSS.

¹ Journal of the Buddhist Text Society, Vol. II, Pt. III, Calcutta 1894.
P. III.

² Ibid, pp. IX, X.

- | | |
|----|---|
| 1. | Mohamayuri vidya-rajui—translated by I'tsing 705 A.D. |
| 2. | „ „ „ „ Amoghavajra 746
to 771 A.D. |
| 3. | „ „ „ „ Sanghapala 516
A.D. |

Again many articles are common to the Hindus and Chinese *materia medica*; as many aromatics (nutmeg, cloves, cinnamon and pepper), musk, rhubarb etc. And this is not at all surprising for we have evidence "that there was constant intercourse¹ between these countries even before the Christian era, by means of travellers and ambassadors; and that Buddhist priests in visiting China, took with them as presents classical Indian books. It is also worthy of note, in connexion with the chapter on this subject in *Suśruta*, that in A.D. 648, the Emperor of China having sent an ambassador to India, this officer met with a doctor, who told him that he was 200 years old, and that he possessed the recipe of immortality, upon hearing which, a second embassy was despatched in search of the philosophical stone" (Royle).

Even the modern medical science of Europe has been directly influenced by the Hindu system of medicine. In the *materia medica* used by the doctors in Europe now, we find the following curative agents—the produce of India. I quote here the list as prepared by Thakore Shaheb² :—

"Aconitum heterophyllum	...	Ativisha.
Allium cepa	...	Polandu.
Acacia catechu	...	Khadira.

¹ See Asiatic Journal, July 1836.

² History of Aryan Medical Science, P. 128.

Alhagi maurorum	...	Yavasa.
Alstonia scholaris...	...	Saptaparna.
Ammomum elettarum	...	Ela.
Andropogon nardus	...	Ushira.
Andropogon schænanthus	...	Katurina.
Artemisia sternutatoria	...	Agnidamani.
Berberis lycium ...	...	Daruharidra.
Butea frondosa ...	...	Palasha.
Cassia lanceolata ...	...	Sonamukhi.
Cucumis colocynthis	...	Indravaruni.
Datura alba, niger &c.	...	Dhattura.
Justicia adhatoda...	...	Atarusha.
Luffa amara ...	...	Katukoshtaki.
Linum usitatissimum	...	Atasi.
Mallotus Philippiensis	...	Kapillaka.
Myrica sapida ...	...	Katfala.
Ophelia chiretta and Ophelia augustifolia ...	...	Kirata.
Pimpinella Anisum	...	Shatapushpa.
Pongamia glabra...	...	Karanja.
Ptychotis ajowan ...	...	Ajamoda.
Ricinus communis	...	Eranda.
Salvinia cucullata	...	Undurkarnika.
Santalum album & Santalum flavum ...	...	Chandana.
Shorea Robusta ...	...	Ajakarna.
Strychnos potatorum, Strychnos nux vomica ...	...	Katakafala.
Tinospora Cordifolia	...	Guðuci.

<i>Valeriana Hardwicki</i>	...	Tagara.
<i>Wrightia Antidysenterica</i>	...	Indrayava."

To this list may be added the following; drugs from the Indian and Colonial Addendum to the British Pharmacopœa, 1898 :—

<i>Acacia Arabica</i>	...	Vāvvula.
<i>Acalypha Indica</i>	...	Muktabarśi.
<i>Andrographis Paniculata</i>	...	Kirāta.
<i>Aristolochia Indica</i>	...	Arkamula.
<i>Arachia Hypogaea</i>	...	Bucanaka.
<i>Citrus Aurantium</i>	...	Nāgaraṅga.
<i>Azadirachta Indica</i>	...	Nimba.
<i>Aegle Marmelos</i>	...	Vilva.
<i>Piperbetel</i>	...	Tāmbula.
<i>Butæa Gummi.</i>		
<i>Cæsalpina Sappan</i>...	...	Patanga or Bakam.
<i>Calotropis Procera</i> and <i>C. Gigantiae</i>	...	Arka.
<i>Gossypium Herbaceum</i>	...	Kārpāsa.
<i>Cambogia Indica.</i>		
<i>Cissampelos Pariera</i>	...	Ambashthai.
<i>Coseinum Fenestratum</i>	...	Dāru-haridrā or darvi.
<i>Gynocardia Odorata</i>	...	Chālmugra.
<i>Hygrophila Spinosa</i>	...	Kokilākṣa.
<i>Anogeissus Latifolia</i>		
<i>Embelia Ribes</i> and <i>E. Robusta</i>...	...	Vidaiga.
<i>Plantago Ovata</i>	...	Ispaghula.
<i>Ipomæa Hederacea</i>	...	Kālādāna.
<i>Ipomæa Turpethum</i>	...	Trivit.

Mylabris Phalerta.

Terminalia Chebula ... *Haritakī.*

Sesamum Indieum ... *Tila.*

Picerorhiza Kurroa ... *Katuka.*

Urginea Indica ... *Vanapalāñdu.*

As regards the medicines used by the Hindus, Neuberger says¹ :

"The Pharmacopæia, corresponding with the fruitful nature of the land was a rich one and stamps Indian medicine with a character entirely its own, whilst nothing speaks more eloquently for its originality than the fact that of all the many medicinal plants no single one was European."

Elphinstone wonders at the knowledge of simples in which the Hindus early gave lessons to Europe and "more recently taught us the benefit of smoking *Datura* in asthma and the use of *cowitch against worms*," and "the prescribing of *Nux Vomica* in paralysis and dyspepsia, and the revival of the use of *Croton Tiglum*" (Royle). In surgery, too, the modern surgeons of Europe have borrowed the Indian method of Rhinoplastic operation first made known to European surgeons by a letter which was printed in the Gentleman's Magazine for October 1794, p. 891. In fact Dr. Hirschberg of Berlin says that "the whole plastic surgery in Europe had taken its new flight when these cunning devices of Indian workmen became known to us. The transplanting of sensible skin flaps is also an entirely Indian method." The modern method of making pockets for the

¹ Neuberger, History of Medicine, vol. I. P. 54.

testicles under the Colles' fascia after the operation for scrotal tumour (elephantiasis) can be traced back to the age of Suśruta¹.

Thus we see that it can safely be affirmed that the medical science of Europe has been, both directly and indirectly, influenced by the Hindu System of Medicine.

¹ पादौ निरस्तमुष्कस्य जलेन प्रोत्य चाक्षिणी ।

प्रवेश्य तुन्यसेवन्या मुष्कौ सौव्येत्ततः परं ॥

Suśruta Saṃhitā, IV. ii.

THE END.

APPENDIX.

I'Tsing¹ says :—

"The following are the eight sections of medical science. The first treats of all kinds of sores ; the second, of aeupuncture for any disease above the neck ; the third, of the diseases of the body ; the fourth, of demoniac disease ; the fifth, of the Agada medicine (i.e. antidote) ; the sixth, of the diseases of children ; the seventh, of the means of lengthening one's life ; the eighth, of the methods of invigorating the legs and body. 'Sores' (1) are of two kinds, inward and outward. The disease above the neck (2) is all that is on the head *and face* ; any disease lower down from the throat is ealled a 'bodily' disease (3). The 'Demoniac' (4) is the attack of evil spirits, and the 'Agada' (5, but 6 of Âyur-veda) is the medicine for counteracting poisons. By 'Children' (6, but 5 of Âyur-veda) is meant from the embrayo stage until after a boy's sixteenth year ; 'lengthening life' (7) is to maintain the body so as to live long, while 'invigorating the legs *and body*' (8) means to keep the body and limbs strong and healthy. These eight arts formerly existed in eight books, but lately a man epitomized them and made them into one bundle. All physicians in the five parts of India practise according to *this book*, and any physician who is well versed in it never fails to live by the official pay. Therefore Indians greatly honour physicians and much esteem merchants, ~~for~~ they do not injure life, and they give relief to others as well as benefit themselves. I made a successful study in medical

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 127-8.

science, but as it is not my proper vocation I have finally given it up."

Dr. Takakusu¹ comments on the passage as follows :—

"The eight sections of Medicine which I-tsing describes are no doubt the eight divisions of the *Âyur-veda*. He mentions an epitomiser of these divisions, who seems to have been a famous physician and contemporary of I-tsing (or just before I-tsing). This epitomiser may be Susruta, who calls himself a disciple of Dhanvantari, one of the Nine Gems in the Court of Vikramâditya.

Prof. Wilson says in his Works, vol. iii, p. 274 :—

'The *Âyur-veda*, which originally consisted of one hundred sections, of a thousand stanzas each, was adapted to the limited faculties and life of man, by its distribution into eight subdivisions, the enumeration of which conveys to us an accurate idea of the subject of the *Ars Medendi* amongst the Hindus.'

The eight divisions are as follows :—

I. *Sâlya* (I-tsing's (1) cure of sores).

The art of extracting extraneous substances, grass, earth, bone, &c., accidentally introduced into the human body, and by analogy, the cure of all phlegmonoid tumours and abscesses. *Salya* means a dart or arrow.

II. *Sâlâkya* (I-tsing's (2) art of acupuncture).

The treatment of external organic affections or diseases of the eyes, ears, nose, &c. It is derived from *Salâkâ*, "a thin and sharp instrument," and is borrowed from the generic name of the slender probes and needles used in operation on the parts affected.

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 222-3.

The above two divisions constitute the surgery of modern schools.

III. Kâya-kikitsâ (I-tsing's (3) treatment of the diseases of the body).

The application of the Ars Medendi (*Kikitsâ*) to the body in General (Kâya). It forms what we mean by the science of medicine.

IV. Bhûta-vidyâ (I-tsing's (4) treatment of demoniac disease).

The restoration of the faculties from a disorganised state induced by demoniacal possession. The art vanished before the diffusion of knowledge, but it formed a very important branch of medieval practice through all the schools, Greek, Arabic, or European.

V. Kaumâra-bhritya (I-tsing's (6) treatment of the diseases of children).

The care of infancy, comprehending not only the management of children from their birth, but the treatment of irregular lactic secretion, and puerperal disorders in mothers and nurses.

VI. Agada (I-tsing's (5) Agada medicine).

The administration of antidotes—a subject which, as far as it rests upon scientific principles, is blended with our medicine and surgery.

VII. Râsâyana (I-tsing's (7) application of the means of lengthening one's life).

Chemistry, or more correctly alchemy as the chief end of the chemical combinations it describes, and which are mostly

metallurgie, is the diseovery of the universal medicine—the elixir that was to render health permanent, and life perpetual.

VIII. *Vâgîkarana* (I-tsing's (8) methods of invigorating the legs and body).

Promotion of the increase of the human raee—an illusory research, which, as well as the preeeding, is not without its parallel in aneient and modern times.'

Prof. Wilson further remarks :—‘We have, therefore, ineluded in these branches all the real and fanciful pursuits of physieians of every time and placee. Susruta, however, eonfines his own work to the classes *Sâlyâ* and *Sâlâkya* or surgery ; although, by an arrangement not uncommon with our own writers, he introduces oeeasionally the treatment of general diseases and the management of women and children when discussing those topics to which they bear relation.’ (See Wilson’s Works, vol. iii, p. 276.)”

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INDEX.

ENGLISH.

A

	PAGE.
Abdominal binder	181, 188
Abscess	233, 244, 249, 250, 251, 252, 254, 279, 291
Acacia Arabica	360
—catechu	39, 358
Acalypha Indica	360
Acanthobolus	207
Accessory Instruments	91, 94, 97, 175
—Sharp Instruments	282
Accipitar	179
Aconitum heterophyllum	358
Acorus calamus	39, 41
Actual cautery	216, 234
Actuarius	354
Adams	xvi, 18, 146, 166, 169, 170, 201, 210, 217, 221, 224, 232, 258, 336
Ægle marmelos	38, 40, 268, 281, 353, 360
Æsculapius	156, 329, 342
Aetius	166, 169, 207, 217, 228, 230, 266, 336, 346
Agallochum	346, 355
Agate	343
Aggur	355
Agila	355
Ahmedabad	50
Ainsle	331
Akimona	355
Alberuni	vii, 10, 16, 324, 334, 350, 352
Alberuni's India, Edited by Sachau	viii

PAGE.

Albucasis	108, 120, 123, 155, 166, 218, 223, 228, 230, 256, 260, 261, 266, 272, 277				
Albutt	...	...	...	...	329
Alexander	...	...	...	62, 153, 344	
Alexander Trallianus	...	...	...	116, 336	
Alexandria	...	...	...	340	
Alexandrian School	...	...	...	285	
Alhagi maurorum	...	...	...	359	
Ali Ibn Zain	...	...	...	10	
Allium cepa	...	...	...	358	
—Sativum	...	...	...	39	
Aloes	...	...	...	343	
Alpina Galangala	...	...	...	353	
Alsaharavius	...	...	...	201	
Amber	...	...	...	346, 355	
Ambergrise	...	...	...	355	
Ambrose Pare	...	...	...	272	
Amir Ali	...	...	...	57	
Ammomum graui paradisi	...	...	...	353	
—elettarum	...	...	...	359	
Amputation	...	...	...	231	
Analecta Medica	...	...	...	354	
Anæsthetics	...	...	...	iii, 59, 60	
Anatomy	...	...	...	284, 285, 340	
Ancient India	...	...	...	343	
Aneylotomus	...	...	...	267	
Andreas a Cruce	...	...	...	88	
Andrographis Paniculata	...	...	...	360	
Andropogon Muricatus	...	...	...	284	
—nardus	...	...	...	359	
—Schænauthus	...	...	...	41, 359	
Angeissus Latifolia	...	...	...	360	
Animal Hospital	...	...	...	50	
Animism	...	...	...	337	
Anthocephalous Kadamba	...	...	...	39, 292	

	PAGE.
Antiquity of Hindu Medicine	23, 62, 330, 341
Antiseptic	... 144, 183
Ants	... 208, 209
Antyllus	... 154, 190, 191
—Band of	... 190
Aod Hindee Agallochum	... 355
Apolinose	... 210, 221
Apollo	... 342
Aquilia	... 355
Arabic Translation of Sanskrit Works	... 353
Arabic additions in Greek Meteria Medica	... 353
Arachia Hypogœa	... 360
Aræteus	... 60, 116, 146, 154, 254
Archigenes	... 164
Architecture of the Hindus	... 89
Areca catechu	... 354
Arrian, vii.	...
Aristolechia Indica	... 360
Aristophanes	... 303
Army Surgeon, ii	...
Aroma-pipes	... 85
Arrow	... 198, 199
—Extraction of	... 210, 213
Arrow-stem like rods	... 93
Arsenal de Chirrug	... 120
Artemesia Indica	... 353
Artemisia sternutatoria	... 359
Artery, delegation of	... 221
Ascites	... 122, 123, 242, 258
Assafœtida	... 41
Assyrian medicine	... 338, 341
Asthma	... 361
Astringent	... 221, 222
Astronomy	... 347, 348
Athens, v.	...

				PAGE.
Atomic Theory	...	...	...	333
Atramentum	...	...	...	346
Atroearpus	...	...	...	268
Aural Probe	...	...	...	219
—Polypus	...	...	...	278
Avenzoar	...	...	...	169
Avicenna	...	166, 167, 223, 260, 350, 353		
Awl	...	..	... 95, 205, 262	
Axe	...	...	... 95, 254	
Azadirachta Indica	...	...	...	292, 360

B

Babylon	...	...	...	348
Bag	...	84, 85, 121, 129, 130, 133		
—defects of	...	...	...	133
Bagdad	...	...	...	351
Bahram	...	...	...	350
Bairotsana	...	...	...	356
Balanee	...	...	...	324
Balanites Rox	...	...	...	37
Baldness	...	...	...	253
Balena Cristata	...	...	...	272
Baliospermum montanum	...	...	...	219
Balsamodendron mukul	...	...	...	41
Bamboo	82, 83, 117, 125, 177, 194, 200, 278, 282, 283, 297, 309, 315, 325			
—forceps		...	...	106
—pipe	...	...	...	140
—tube	...	...	...	129
Bane de Hippocrate	...	...	...	89
Bandaging	...	...	...	281
Bandages	...	...	...	94, 176
—Kośa	...	...	...	177

	PAGE.
Bandages Dāma	177
—Svastika	177
—Anuvellita	177
—Protolī	177
—Mandala	177
—Sthagikā	178
—Yamaka	178
—Khattvā	178
—Cina	178
—Vivandhana	178
—Vitāna	178
—Gophanā	178
—Pancāngi	179
—Mode of application of	179, 180
Banner bandage	178
Banyan Hospital	50
Barber	302
Barks, of trees	94, 177, 189, 193, 195, 283, 284
Bar-Magnet	213
Barmak	351, 352
Barmekides	10
Barnes	181, 202
Barnes' speculum	119
Baron de Saey	349
Barzouyeh	350
Basdeo	350
Basella Rubra	292
BATH : ...	...
—Hot	323
—Ordinary	313
—Medical	313
—Vapour	322
Bathing	313, 314
Bdellium	346, 354
Beal	vii, foot note 48, 299, 308, 317

	PAGE.
Beal's Buddhist Records ... vii, foot note 1, 12, 48, 49, 299, 308, 317	
Bear forceps	96, 102
Bed-pan	36, 317
Bedrœ	344, 353
Bell-metal	64, 314, 125, 325
Bellows	328
Bench of Hippocrates	88
Beneras	3, 11, 32
Berberis lycium	359
Berlin	3
Berry	105
Betula Bhojpatra	39
Bhagalpur	16
Bhilsa Topes	319, 327, 346
Bibliotheca Indica, xv	17
Bignonia Snavolens	310
Binder	188
Binding apparatus	185
Birdwood	344
Bivalve Speculum	119, 120
Bijnor	63
Bladder Sound	125
Blankets	177
Bleeding Lanceet	248
Blood-stick	257
Bloomfield	4
Blow	201
Blue-Jay forceps	103
Blunt Instruments	90, 96, 99
————— Description of	100
——hook	97, 166
——Probe	270
Board	86
Boil,	282 308

PAGE.

Boil, Treatment of	...	...	...	182
Bone	...	...	67, 82, 83, 85, 117	
— Lever	...	...	...	172
Boots	...	...	...	308
Borax	...	...	...	354
Botanical Geography	...	...	...	334
Bower MSS.	...	...	...	357
Box for ointments	...	...	...	82
Branch of a tree	...	...	94, 210, 295	
Brass	...	...	123, 125, 300, 326, 328	
Bridle ring	...	...	...	210, 211
British Museum	...	...	...	154
Broad Bandage	...	...	...	177
Bronze	...	...	...	82, 83
Brown	...	...	...	337
Brussels	...	...	...	174
Bucher-bird forceps	...	...	...	103
Bud shaped rods	...	...	...	93
Buddha Gurus	...	...	...	344
Buddhist Birth-stories	...	...	...	339
— Missionary	...	...	...	345
— Text Society	...	...	...	357
Buhler	...	...	...	3
Burgess	...	...	...	12
Burnell	...	...	...	5
Butea frondosa	...	...	...	359
— Gunmi	...	...	...	360
Buqrat	...	...	...	346

C

Cælius aurelianus	...	...	...	269
Cæsalpina Sappan	...	...	...	360

			PAGE.
Calopter	...	...	113
Calotropis Procera	...	...	360
—Gigantiae	...	...	360
Cambogia Indica	...	...	360
Camper	...	...	258, 272
Cancer of the Breast	...	...	215
—Knife	...	...	217, 218
Cane	...	...	177, 309
Canopy Bandage	...	...	178
Canula	...	...	122, 123, 260, 261
Caps	...	...	305
Carter	...	...	213
Cases of instruments	...	...	80
—ointment sticks	...	...	83
Cassia fistula	...	...	353
—obvata	...	...	353
—lanceolata	...	...	359
Cataract	...	...	273
—Reclination of	...	...	63
—operation of	...	...	273
—Couching of	...	...	273, 274
—Binder	...	...	188
Cat forceps	...	...	102
Catheters	...	...	137
Caustic	...	94, 213, 214, 215, 219, 290	
—Thread	...	...	175, 270, 271
Cautery	...	213, 216, 223, 281, 290, 357	
Cedrus deodara	...	...	219
Celsus	...	60, 108, 110, 112, 117, 123, 154, 164, 165, 169, 174, 199, 210, 218, 223, 231, 246, 260, 266, 272, 273, 276, 349	
Cephalandra Indica	...	...	268
Cephalotribe	...	...	165
Chaldae	...	...	348

	PAGE.
Chamberlens	167
Chank-Shell	82, 83, 85, 117, 325
Chebulic Myrobalan	37, 41
Chemistry	333
Child's room	40
China root	32
Chinese Medicine	341
Ching-Che-Chun-Ching	341
Chintz	304
Chœnicides	231
Cinnamon	342, 355
Circular shaped instrument	96
——— Bandage	177
——— Cross Bandage	177
——— Chest Bandage	178
Circulation of Blood	332
Cissampelos Pariera	360
Citrus medica	354
Citrus Aurantium	354, 360
Clement	340
Clement of Alexandria	345
Cloth	94, 177, 186, 189, 197, 304, 309, 310, 311, 321
Cloth sieve	320
Clyster	86, 97, 281, 342
———urethral, rectal, vaginal	281
Cocculus cordifolias	220
Cold application	320
Colcbrooke	346
Collection De Chirurgiens Grecs	88
Collyrium Probe	97, 160, 161
——— Pot	324, 325
Comb	303, 304
Continued sutures	209
Convolvulas	353
Cook	43

	PAGE.
Copper	63, 121, 123, 125, 160, 161, 162, 218, 273, 297, 300, 301, 314, 316, 325, 328
—Probe	... ... ... 272, 275
Coral	... ... ... 66, 325
Cordier	... ... ... 12, 24, 27
Corner	... ... ... 261
Cos	... ... ... 347
Coscinum fenestratum	... ... ... 360
Cotton	... ... ... 177
Craniotomy	... ... ... 239
Creepers	... ... ... 94, 196
Crescent shaped cautery	... ... ... 172
Cripple	... ... ... 196
Crocodile	... ... ... 99
—forceps	... ... ... 102
Crooke	... ... ... 50
Crotalaria juncea	... ... ... 219
Crotchet	... ... ... 166, 195
Crow forceps	... ... ... 96, 103
Cruciform Instruments	... ... ... 91, 92, 100
Crystal	... ... 282, 286, 310, 316, 325
Csoma de Koros	... ... ... 356
Cucumis Sativus	... ... ... 280
—Colocynthis	... ... ... 359
—Utilissimus	... ... ... 280
Cucurbita Pepo	... ... ... 39
Cucurbitula	... ... ... 342
Cullen	... ... ... 337
Cupping	... ... 148, 149, 150, 152
—bow	... ... ... 386
—Instrument	... ... ... 97
Cunningham	... ... 30, 50, 319, 327, 346
Cureuma Longa	... ... ... 291, 292
Cureton	... ... ... 353
Curlew forceps.	... ... ... 103

PAGE.

Cythescomele,	158 160
---------------	-----	-----	-----	---------

D

Daimacus	...	...	...	844
Dallvāṇa's Commentary	...	...	12, 17, 57, 87	
Dandruff	...	...	...	303
Dandy	...	...	...	356
Dar A tharvaveda	...	...	...	3
Dareheeni	...	...	...	355
Darsheeni	...	...	...	355
Davam Non-gah	...	...	...	356
Dawn of Civilization	...	...	...	341
Dead Fœtus ; Extraction of	...	...	...	165
Decapitating hook	...	...	...	225
De Medicio	...	...	...	37
De Med. Ægyptiorum	...	...	...	153
Deedara	...	...	...	354
Deiudar	...	...	...	354
Delivery hook	...	...	...	97
Dengue	...	...	...	356
Depilation	...	...	...	303
Deodara	...	...	...	354
Deer forceps	...	...	...	96, 102
Dhatura alba	...	...	...	359
DHN	...	...	...	352
Diagnosis	...	...	...	202
Diary	...	...	...	36
Diaz	...	...	...	347
Dietz	...	...	...	345, 352, 353
Dilators	...	...	...	123, 125
—urethral	...	...	...	123, 125

			PAGE.
Dilators, Rectal	...	...	124, 125
Diodorus Seculus	...	...	343
Dionysos	...	...	345
Diopter	...	...	113, 120, 342
Diospyros Embryopteris	...	...	39
Dioscorides	...	...	59, 346
Director	...	...	173, 174
Discription of Hindusthan	...	...	50
Disenfection of rooms	...	...	147
Dislocation	...	...	194
—————of the neck	...	...	194
—————lower jaw	...	...	201
Dispensaries, vii	...	...	34, 49, 57
Dissection	...	...	283
Dissection forceps	...	...	266
Distillation	...	...	334
Diudar	...	...	353
Division	...	...	280
Dolichos lebleb.	...	...	354
Dolichos Biflorus	...	...	37
—————Uniflorus	...	...	39
Domitan	...	...	303
Door-bed	...	...	87
Double nose-spoon	...	...	85
—————bag	...	...	85
—————bandage	...	...	178
—————edged knife	...	...	244
Dress	...	...	304, 305
Dressing forceps	...	...	106
Drinking Vessel	...	...	314
Dropper	...	...	327
Dropsy, 257	...	...	260
Dublin	...	...	195
Dung	...	...	216
Dunglison	...	...	179

E

Eagle Forceps	...	...	...	105, 202
Early History of India	...	...	...	6, 35, 49
Earth	...	...	312, 314, 316, 326, 328	
Earth-worm like rod	...	...	...	93, 97
Earthen Ware	...	...	...	312
Ear scoop	...	...	...	107, 164
—Specillum	...	...	...	158, 164
—cleaner	...	...	...	163
—Perforator	...	...	...	263
Ebers Papyrus	...	...	...	340
Ebony	...	...	342, 343, 344, 346, 355	
Edge	...	...	...	61, 69, 73
Edict of Asoka	...	...	...	47
Edinburg Medical Essays	...	...	...	240
Egypt	...	...	...	153, 344
Egyptian women	...	...	...	303
—Medicine	...	...	...	338
—Physicians	...	...	...	340
Electro-magnet	...	...	...	213
Elettarium Cardamomum	...	...	...	39
Elephantopus Seaber	...	...	...	291
Elphinstone, xiv	...	...	...	334, 361
Embelic Ribes	...	...	...	39, 360
Embryotome	...	...	...	230
Empyæma	...	...	...	241
Encircling bandage	...	...	...	177
Enfield	...	...	...	348
Enterocèle	...	...	...	246
Epilation	...	...	...	105, 202
Erasistratos	...	...	...	285
Erichsen	...	106, 110, 149, 201, 213, 245		
E. Robusta	...	...	...	360
Evacuation	...	...	...	281

			PAGE.
Excision	...	...	256, 266, 280
Execution	...	...	68
Extant Works of <i>AEtius</i>	xvi	...	...
Extraction	...	...	281
—of foreign bodies from throat			109, 197 201
——— from ear	...	...	199
——— from eyes and teeth	...	...	213
——— of thorn	...	...	205
——— of bone	...	...	203, 210
——— of fish bone from throat	...	...	206, 297
——— dead fœtus	...	...	165, 226
——— needles	...	...	238
——— soft structures			244
Extraction of stones from Urethra	...	...	265
——— tartar from teeth	...	...	268
Ezion-Gaber	...	...	344

F

Fa Hian	...	...	...	49, 317
Falcon Forceps	...	...	...	103
Fan	...	...	...	308
Faufil	...	...	...	354
Fear	...	...	...	98, 212
Female catheter	...	...	...	137
Fergusson	...	...	...	159, 255, 324
Ferrula Assafætida	...	...	...	39
Field-hook	...	...	...	181
—surgery	...	...	...	332
Ficus Bengalensis	...	...	...	220, 292
—Religiosa	...	...	...	292
Fihrist	...	...	...	9, 351
File	...	...	...	269
Fillet	...	...	...	167, 190

	PAGE.
Filfil	355
Filters	309, 319
Finger	83, 94, 161, 199, 200, 208, 291
—Knife	... ... ... 34, 94, 238
—guard	... ... ... 97 118
Firainga roga	... ... ... 28, 32
Fire	... ... ... 94, 290
Firroz Shaha	... ... ... 352
Fish-hook	... ... ... 93, 95, 264
Fish-bone, Extraction of	... ... ... 206
—forceps	... ... ... 207
Fissorius	... ... ... 256
Fistula-in-ano	... ... ... 271
Five-faced instrument	... ... ... 96
Five tailed bandage	... ... ... 179
Flax	... ... ... 210, 221
Fleam	... ... ... 256, 257
Fleet	... ... ... 6
Flower of Barley and Wheat	... ... ... 219
Fluxing	... ... ... 94, 212
Flügel	... ... ... 352
Fly-Brush	... ... ... 308
Fœtus-Hook	... ... ... 165
Forceps	... ... ... 92, 167
Fork-tailed forceps	... ... ... 103
Foreign origin of Hindu Medicine	... ... ... 348
Foot, sole of	... ... 94, 199, 200, 202
Foubert	... ... ... 272
Four-tailed bandage	... ... ... 178
Fracture-bed	... ... 86, 87, 88, 89
Fracture of nasal bone	... ... ... 117
—the lower extremity	... ... ... 193
—and dislocations	... ... ... 195
—of carpal and metatarsal bones	... ... ... 198
France	... ... ... 303

				PAGE.
Francis	...	...	...	335
Fufal	...	...	...	355
Funis	...	...	...	282
Fumigation	...	...	...	63, 144

G

Galanga	...	...	...	355
Galangal	...	...	...	353
Galen	x, 60, 164, 171, 191, 218, 223, 231, 232, 269, 330			
Galzlaaff	...	...	...	341
Gangrene	...	...	...	231
Gastroraphe	...	...	...	221
Gamma shaped cautery	...	...	...	160
Gauze	...	...	...	182
Genuine Works of Hippocrates	xvi, 88, 113, 169, 174, 108			
Ghoom Monastery	...	...	...	357
Gingivitis	...	...	...	291
Giudo-de-Cauliaco	...	...	...	272
Glands	...	...	...	200, 236
Glass	...	...	125, 140, 282, 286, 316	
Gloriosa Superba	..	...	...	39
Gmelina Arborea	...	...	...	292
Goad-like rods	...	...	...	93
Gold	... 64, 65, 66, 82, 83, 84, 117, 125, 135, 160,			
	161 177, 218, 273, 278, 299, 312, 314, 316, 325, 326.			
—Probe	...	...	...	218, 219
Goldstuker	...	...	...	1
Gossypium Herbaceum	...	...	...	360
Gouge	...	...	...	199
Gourd	...	...	...	109, 150, 342
Granular lids	...	...	...	293
Greece	...	...	...	349

	PAGE.
Greeco-Roman Surgical Instruments	xvi, 146, 147, 153, 163, 167, 174, 199, 228, 230, 240, 246, 313.
Grewia Asiatica	... ... ... 37
Griffith	... ... ... 3
Grind stone	... ... ... 327
Gum-boil	... ... ... 242
Gunshot Injuries	... ... ... 200
Gut	... ... 98, 220, 221, 222
Gynocardia ordorata	... ... ... 360

H

Hahneman	...	...	...	338
Hair	...	...	94, 205, 206, 234, 304	
Half-moon	...	...	...	96, 97
—probe	...	...	...	171
Half-moon Scissor	...	...	...	251
—Knife	...	...	...	251
Haly Abbas	...	...	120, 166, 219, 230, 260	
Hammer	...	94, 96, 111, 198, 199, 256,	328	
Hamilton	...	...	...	56, 195
Hand	...	...	90, 199, 200, 203	
—Palm of	...	...	...	94, 321
Happiness	...	...	...	212
Hammurabi	...	...	...	339
—Laws of	...	...	...	339
Harp-string	...	...	...	221
Hartal	...	...	...	355
Harun-Al-Rasid	...	...	...	29, 35I, 352
Haas	...	...	...	347
Hawk	...	...	...	103
Head dress	...	...	...	305
Headache	...	...	...	344

	PAGE.
Herculaneum	v
Hermetic Books	340
Hero	153
Heron forceps	96, 101, 103
Herodotus	191
Herophilus	269, 285
Hesepiti	340
Hessler	17, 91, 104
Heyne	57, 326, 331
Hipparchus	348
Hippocrates	37, 88, 113, 123, 146, 159, 165, 169, 170, 173, 180, 210, 216, 217, 218, 221, 232, 239, 241, 258, 271, 272, 303, 347, 349.
Hipocratic oath	169, 345
Hipocratists	284, 285
Hindu system of Medicine	xv
Hiram	344
Hirschberg	361
Hist. De la medicine	232
Historia Forcepum-et-vecticun	166
Historian's, History of the World	340, 348
History of Aryan Medical Science	xv. 23, 29, 316
History of Hindu Chemistry	6, 24, 28, 290
History of Indian Literature	346
History of philosophy	548
History of Medicine	209, 285, 286, 331, 347, 361
History of the Saracens	57
Hiuen Tsiang	47, 299, 308
Hœrnle	5, 15, 16, 17, 19, 20, 21, 22, 24, 29, 204, 214, 216, 243, 251, 284, 331, 332.
Hœmorrhage	221
—arrest of	221, 222, 223, 324
Hoffman	337
Hook	70, 96, 106, 165, 227, 229, 264, 266, 342
—Lithotomy	97

	PAGE.
Hook, Delivery	97
— Blunt	91
Hollow Instruments	91
— Cylinder Bandage	177
Horace	343
Hordeum Vulgare	37, 41, 265
Homer	221, 340
Horn	66, 67, 82, 83, 96, 97, 109, 117, 119, 125, 148, 154, 161, 205, 325, 342.
Horse-hair	205, 208, 210
— Probang	207
Horse's Bridle	94, 210
Hospices	48
Hospitals	iv. vii, 8, 34
— requisities	295
— Merit of erecting	51, 52, 53, 54, 55
House of mercy	49
Hot Application	320
— Bath	323
Humoral Pathology	333
Huth George	23
Hycna forceps	102
Hydrocele	123, 205, 218, 242, 259, 261
Hydrophobia	342
Hydroctyle Asiatica	39
Hygienic appliances	295
Hygrophila spinosa	360
Hypodermic medication	235
— Syringe	235
Hwangati	341

I

Iatrum	37
--------	----

	PAGE.
Ibn Abillsaibial	18
Iguana faced instrument	95
Imhotpu	341
Impellent	111
Impomea Haderacea	360
Impœa Turpethum	360
India in Greece	344
Indian Medicine	29
Indian Antiquary	6
Indian Antiquities	162
Indian Tracts	326
Indian Nelumbium	345
Indian Physicians in foreign court	351
Indian drugs in Greek Meteria Medica	353
Indian Rhubarb	354
Indigo	346
Indica	vii, 344
Indo-Aryan	62, 196, 304, 305, 308
Industrial arts of India	344
Inflammation	219
Instruments, Uses of	74
—————Good and bad qualities of	73, 74
Interrupted suture	209
Intestinal obstruction, Operation for	209
Introduction	1
Iron	61, 91, 123, 160, 162, 177, 213, 218, 273, 278, 297, 315, 325, 326, 328.
I' Tsing	19, 20, 21, 22, 23, 24, 297, 303, 312, 313, 317, 358.
Italy	303
Itch-cloth	182
Ivory	67, 82, 83, 117, 125, 204, 325, 343, 344.
J	
Journal American Oriental Society	34

				PAGE.
Jaekal forceps	...	...	...	102
Jacobi	...	...	...	195
Jewet	...	...	...	195
Jolly	...	...	19, 21, 22, 29, 331	
Jones, Sir William	...	...	192, 193, 329	
Journal Asiatic Society of Bengal	...	...	6, 23, 30	
Journal Royal Asiatic Society	...	...	6, 15, 19, 22	
Joy	...	...	...	212
Jury mast	...	...	...	194
Justicia adhatoda	...	...	...	359
Jute	...	...	...	189
Juvenal	...	...	...	303

K

Kaimonis	...	...	...	355
Kali	...	...	...	355
Kalila and Dimna, Fables of	...	...	...	351
Karaka	...	...	...	9
Kashmir	...	...	...	3, 5
Kassiteros	...	...	...	355
Katiadion	...	...	...	254
Kern	...	...	...	348, 351
Khrisrong Dehutsan	...	...	...	356
Khoraba	...	...	...	355
Kih Futo	...	...	...	308
Kitchen	...	...	...	43
—Superintendent	...	...	...	43
Kitab-Shawshoon-al-Hindu	...	...	...	17
Kitab-i-Susrud	...	...	...	18
Kite Forceps	...	...	...	103
Knife-Shaped saws	...	...	...	231
— double edged	...	...	...	249
— Gold	...	...	...	278

				PAGE.
Knife-Silver	...	...	...	278
— Iron	...	...	...	278
— blades	...	...	...	177
Koningsberg	...	...	...	347
Kordofan	...	...	...	150, 217
Koshta	...	...	...	355
Koosrus	...	...	...	355
Kootha	...	...	...	355
Ktesios	...	...	...	344, 345, 349
Kust	...	...	...	355

L

L' Historia du Budh Ind	...	...	...	12
Lac	...	...	82, 83, 117, 123	
Lama Šes-rale MGya Mtsho	...	...	...	357
Lau man	...	...	...	3
Laneet	...	...	...	260, 357
— Double-edged	...	...	...	242
— Straight	...	...	...	242
Lapis-Lazuli	...	...	314, 316, 325	354
Lhasa	...	...	...	357
Lead	...	63, 122, 123, 125,	160, 177, 218,	300
Leather	...	...	94, 177, 184, 185,	189
— Bandage	...	...	...	184
— Ligature	...	...	...	185
— Shaekle	...	...	...	185
— Binder	...	...	...	188
— Bags	...	...	...	188
— Bag for the head	...	...	...	188
— Band	...	...	...	189
— Bottles, jar	...	...	...	191, 193
— Belt	...	...	...	193
— Shoe	...	...	...	307

	PAGE.
Leaves.	253, 291, 292, 309, 315, 316
Lee	343
Lceeh	247, 282, 286, 350
— Poisonous	287
— Non-Poisonous	287, 288
— Application of	288
— Bite of	289
Leeds	213
Lemon	354
Lenticular	199
Leprous spot	247
Life of Atisa	30
Ligature	176, 205, 220, 223, 245
Linen	315
Linum usitatissimum	39, 359
Linseeds	41, 219
Lint	220, 321
Lion	101
— Forceps	96, 101, 102
Liston	245
Lithotomy operation	86
— Straps	185, 187
— hook	97
— Scoop	169
— foreeps	169
— binder	342
— crutch	187
Littlewood	213
Littré	88, 89, 169
Living fætus, Extraction of	167
Loadstone	94
Longmore	200
Long-mouthed-knife	233, 240
Lonsdale	343
Looking glass	304

				PAGE.
Louse	...	...	...	304
Luffa amara	...	...	...	359
Lucknow, Royal Library of	...	...	...	352
Lunatic	...	...	...	279
Lying-in-Room	...	...	...	38

M

MacCrindle	...	...	...	343
Macdonell	...	...	...	3, 81, 303, 330
Mace	...	...	...	353
Machaon	...	...	...	342
Maeis	...	...	...	353
Magnet	...	...	...	212, 213, 333
Maison Dieu of Paris	...	...	...	49
Malabathrum	...	...	...	354
Malatroon	...	...	...	354
Mallet	...	...	...	199
Mallotus Philippiensis	...	...	...	359
Mandragora	...	...	...	60
Manetho	...	...	...	340
Mansil	...	...	...	355
Marsden	...	...	...	215
Marshall	...	...	...	213
Masern	...	...	...	356
Maspero	...	...	...	341
Massage	...	...	...	35, 333
Mussel-shell	...	...	...	326
Materia Medica of the Hindus	...	...	...	XV, 25
Maxmüller	...	...	...	10, 352
McClintock	...	...	...	167
Macrae	...	...	...	329
Measles	...	...	...	356
Measures	...	...	...	324
Medical bath	...	...	...	313

	PAGE.
Medicina Aegyptiorum ...	303
Medicine ...	94, 219
Medieine glass ...	326
Medullary canal ...	263
Megasthenes, ...	xiii, 35, 343, 345
Melia Azadirachta ...	354
Memphis ...	340
Mesne ...	277, 354
Mesua Ferrea ...	310
Metal plates ...	177
Michelia Champaka ...	310
Midwifery Forceps ...	166
Milne xvi, 120, 137, 144, 153, 163, 167, 199, 228, 246, 303.	
Misy ...	355
Modioli ...	231
Mohamayuri Vidya-rajui ...	358
Moringa peterygosperma ...	219
Mortar ...	318, 319, 327
Moschos Moschifera ...	354
Mouth ...	... 94, 205, 264
Mulder ...	166
Muller ...	... 36, 68, 327
Musa Paradisiaca ...	354
Musée de Cinquantenaire ...	174
Mustard seed ...	... 39, 41, 219
Mylabris Phalerta ...	361
Myrica Sapida ...	359
Myrobalani ...	354
Myzon ...	266

N

Nævus ...	245
—Needle ...	245, 246
Nail ...	... 94, 204, 291

				PAGE.
Nail-parer	...	...	...	94, 237
—-shaped cauteries	...	...	...	159
—-shaped rod	...	...	...	98, 159
Nalanda	...	...	...	19
Nala reed	...	...	...	82, 83, 117
Naples Museum	...	V, 113, 120, 137, 154, 158		
Nardostaehys Jatamansi	...	...	...	41
Nasal-insufflator	...	...	...	116
— polypus	...	...	252, 254, 278	
— Speculum	...	...	...	115
Natural History	...	...	...	60
Naubehar	...	...	...	351
Navel cord	...	...	...	278
Nearehus	...	...	...	62, 344
Needle	...	94, 96, 99, 210, 243, 253, 262, 342		
— Curved	...	...	...	245
— Cautery of gold.	...	...	...	66
— Four-ribbed	...	...	...	246
— Golden	...	...	...	65
— Half-curved	...	...	...	245
— Round	...	...	...	246
— Straight	...	...	...	245
— Three-eornered	...	...	...	246
— shaped Probe	...	...	...	271
Neiehing	...	...	...	341
Nerium Odorum	...	...	...	219
Neuburger	...	209, 285, 286, 331, 339, 340, 347, 361		
Neugebauer's speculum	...	...	...	119
New-born	...	...	...	202
Nooshirwan	...	...	...	349
Nose-spoon	...	...	...	84
Number of Surgical Instruments	...	...	...	90
Nurse	...	...	...	45, 202
Nutmeg	...	...	...	353
Nux moschata	...	...	...	353

	PAGE.
Nux Vomica ...	354, 361
Nyctanthes Arbor-tristis ...	291
Nymphae Lotus ...	292
——— Stellata ...	310

O

Obstetric Medicine and Surgery ...	181, 202
Ocimum Basilicum ...	39
Odyssey ...	221
Officina chirrugica venetiis ...	88
Ointment box ...	84
——— pots ...	82
——— sticks ...	83, 84
Olivary probe ...	219
Onyx ...	342, 346
Opening ...	281
Operations ...	6, 8, 15, 24, 74, 76, 77, 78
Operations of General Practice ...	261
Operation-table ...	85
Operative Surgery ...	245
Ophelia augustifolia ...	359
Ophelia chiretta ...	359
Ophir ...	344
Ophthalmia ...	344
Ophthalmic Surgery ...	213
Opium ...	28, 33
Orange ...	354
Oribasius ...	116, 147, 154, 191, 217
Origin and Growth of the Healing Art ...	344
Ornamentation ...	69
Osler ...	329

				PAGE.
Osprey forceps	...	...	...	103
Osteology, Hoernle	...	...	...	5, 15, 16, 19
— of the Hindus	...	...	...	xv, 241, 284
Owl forceps	...	...	...	103

P

Palm	...	...	...	199, 200
Panchanadapura	...	...	...	5
Panicum Dactylon	...	...	...	41
Panther forceps	...	...	...	102
Pao-d'aglia	...	...	...	355
Paracelsus	...	...	...	337
Paracentesis abdominis	...	...	97, 242, 257, 260	
Parulis	...	...	...	242
Pasha, Sir R.	...	...	...	150
Pātaliputra	...	...	...	49
Patient, good qualities of	...	...	...	45
Paulus Ægineta	18, xvi, 105, 108, 110, 111, 112, 113, 117, 118, 120, 123, 149, 154, 159, 160, 163, 166, 170, 171, 172, 173, 187, 191, 199, 201, 205, 207, 217, 218, 219, 221, 223, 224, 228, 231, 232, 238, 242, 246, 354, 358, 260, 261, 266, 271, 277, 293, 336, 342, 346, 348, 349			
Payne	...	...	...	i
Peacock's feather	...	...	...	309
Pearl	...	...	...	310, 354
Pebble	...	...	...	94, 197
Pehlevi	...	...	...	349
Persia	...	...	...	349
Persius	...	...	...	303
Pestles	...	...	68, 172, 173, 318, 319, 327	
Phaseolus mungo	...	...	...	37

				PAGE.
Phaseolous Rox	...	...	...	37, 189
Philadelphous	...	...	...	345
Phlebotome	...	...	230, 241, 242	
Phlebotomy	...	86, 186, 189, 190, 241, 259, 264		
Phoska	...	...	...	356
Phyllanthus Emblica,	...	...	...	37
Physician, Qualities of a	...	...	...	52, 58
Pickloek	...	...	...	91, 93, 106
Picrorhiza Kurroa	...	...	...	260
Pila	...	...	...	319
Piles	...	...	...	86, 205, 293
Pilum	...	...	...	319
Pilpay, Fables of	...	...	...	349
Pilpil	...	...	...	355
Pimpinella Anisum	...	...	...	359
Pineher	...	91, 92, 95, 103, 105, 234, 328		
Pinches	...	...	...	261
Piñjrapoles	...	...	...	50
Pinus	...	...	...	354
Pinus Deodara	...	...	...	39, 353
— longifolia	...	...	...	219
Piper	...	...	...	355
— betel	...	...	...	354, 360
— cava	...	...	...	39
— cubeba...	...	...	...	353
— Longum	...	...	...	39
Pippul	...	...	...	355
Plaeenta	...	...	...	203
— Removal of	...	...	...	203, 208
Plantago Ovata	...	...	...	360
Plantain	...	...	...	354
Plato	...	...	...	146, 341
Playfair	...	...	...	167, 209, 331
Plinthium Nilcii	...	...	...	88, 89, 342
Pliny	...	...	...	60

				PAGE.
Plumbago Zeylanicum	...	...	...	39, 219
Plums	...	...	...	37
Plum-seed-like rod	...	...	...	93
Pocca	...	...	...	356
Pocke	...	...	...	356
Pococke	...	...	...	344
Podalarius	...	...	...	342
Poison, Works on	...	...	...	351, 352
Poison extraction of	...	...	...	198
— Stone	...	...	...	198
Polish	...	...	...	62
Polypus-scalpel	...	...	...	230, 278
Pompeii	...	...	...	V
Pomum somniferum	...	...	...	60
Pongamia glabra	...	...	...	39, 219, 359
Porcelain	...	...	...	312
Portable cases	...	...	...	80, 81, 82
Porus	...	...	...	62
Postural treatment	...	...	...	333
Potential cautery	...	...	...	213, 214
Potsherd	...	...	...	321
Poultice	...	...	...	219, 323
Practical Ophthalmology	...	...	...	105
Pricker	...	...	...	91, 155
Prickly tongue	...	...	...	229
Prinsep	...	...	...	162
Priscianus	...	...	...	157
Probang	...	...	...	207
Probe	...	95, 96, 99, 173, 215, 316, 235, 293		
— Aural	...	...	...	219
— Blunt	...	...	...	270
— Collyrium	...	...	...	160
— Copper	...	...	...	272, 275
— Gold	...	...	...	218, 219
— Half-moon	...	...	...	171

PAGE.

Probe Hard	...	...	...	293
— Jāmvovauṣṭha	...	...	...	159
— Nail-shaped	...	...	...	159
— Needle-shaped	...	...	...	271
— Olivary	..	...	...	219
— Sarapunkha-mukha	...	...	...	171
— Sharp	...	...	...	269, 370
— Snake's hood	...	...	...	168
— Soft	...	...	...	293
— Spoon-shaped	...	...	...	158, 215
— Swab	...	...	...	157
— Urethral	...	...	...	174
Probing	...	...	...	281
Prosper Alpinus	...	...	...	153, 303
Peterygium	...	116, 205, 226, 227, 228, 265, 266		
Pterygotomes	...	...	...	228
Ptolemy	...	...	...	344, 345, 348
Ptychotis ajowan	...	...	...	359
Punjab	...	...	...	5
Punyaśālās	...	...	...	vii, 48
Pupal	...	...	...	355
Pus basin	...	...	...	317
Puschmann	...	...	...	353
Pythagoras	...	...	...	344, 345, 348

Q

Quadrivalve speculum	120
----------------------	-----	-----	-----	-----

R

Raisins	...	...	...	37
Rāmāyana	...	...	...	16
Ramosbotham	...	...	...	225
Ranula	...	...	...	229
Raphanus sativus	...	...	...	229

	PAGE.
Rasendra Cintāmanī	67
Raspatoty	269
Rattan	264
Razor	81, 94, 155, 233, 234, 235, 236, 300, 301
Recentes Découvertes	12
Records of Buddhist Practiees	19
Records of Buddhist Religion	297
Rectal clyster	125
— injections	125
— speculum	113
Reinaud	352
Relation of Hindu and Arabic medieine	350
— of Hindu and Greek medicine	343, 347
— of Sanskrit and Persian medical works	349
Researchees on Operative Midwifery	167
Rest-house	48
Retz	130
Review of the History of Medicine	330
Rgyud Bzhi	356
Rhabarburnum	354
Rhazes	9, 18, 23, 123, 166. 219, 221, 229, 260, 261, 277, 290, 350.
Rheims	163
Rhinoplastic operation	118
Rhys David	339
Rieinus communis	291, 359
Ring knife	240, 342
— Sealpel	239
Rods	... 80, 91, 93, 97, 155, 215
Rogerius	272
Rolleston	329
Rope	177
Roth	3
Round headed knife	94, 225
Royle,	xv, 23, 62, 330, 331, 341, 347, 352, 353, 354

	PAGE.
Rubia Cordifoliatum	130
Ruby	282, 286
Rufus	342
Ryder	35

S

Saccharam Munja	283
Sachau,	10,324,350,351,353
Sacred Beau	345
Sacred Books of the East	4,11,13
Sadej	354
Sahabuddin	269
Sais	341
Saju	355
Sajumattee	355
Sajiloon	355
Sajimen	355
Sakhya	356
Sakkara	355
Salvinia cucullata	359
Sand	321
Sandals	308
Sanskrit Literature	3,81,303,330
Santal	355
— Albumi	359
— Flavum	359
— Rubrum	355
Saraca Indica	41
Sarad	350
Saradaprasad Banerjee	357
Saratchandra Das	357
Sarcostemna brevistigma	220
Satapatha Brahmana	15

				PAGE.
Saunaka School	...	...	...	3
Saussurea Lappa	...	...	...	39
Saw	...	...	73,94,96,230,231,342	
Sayce	...	...	...	341
Sayrc	...	...	...	194
Scales	...	...	...	324
Scammum Hippocratis	...	...	...	88,342
Scarac	...	...	...	350
Scarificator	...	...	...	238
Scarifying	...	...	...	253,254,256,279,281,291
Schultet	...	...	...	120
Sciatica	...	...	...	236
Science and Art of Surgery			106,110,149,201,213,245	
Science of Language	...	...	...	10,353
Scindaspus Officinalis	...	...	...	39
Scirac	...	...	...	350
Scissors	...	...	...	234,249,250
——— Half-moon faced	...	...	...	251
Scoop	...	...	...	278
Scottish National Museum	...	...	...	154
Scraping	...	...	...	300
Scratching	...	...	...	253,293
Serivonius Largus	...	...	...	158
Serotal tumour	...	...	...	234,362
Sebaceous Cysts	...	...	...	242
Sel	...	...	...	354
Semecarpus Anacardium	...	...	...	39
Semti	...	...	...	340
Senna	...	...	...	353
Senta	...	...	...	340
Serapion	...	...	...	9,260,350,354
Sesame	...	...	...	37, 219
Sesamum Indicum	...	...	...	37, 361
Scutonius	...	...	...	303
Sewing	...	...	...	281

	PAGE.
Shampooers	35
Shandana	355
Sharp Hook	264,266
— Instruments	90,94,98,225
— — Mode of holding	279
— Probe	269
Shaving	300,303
Shells of fruit	82,117
Shimgveez	355
Shoes	306,307
— Leather	307
— Wooden	307
Shorea Robusta	359
Short-mouthed knife	233,240
Shoulder, Dislocation of	173
— strap	84,85
Sieves	319
Silk	98,177,304
Silver	64,65,66,82,83,84,117,123,125,160,161, 278,299,312,314,315,325,326,328
Simnoi	345
Simpson	239
Sindaxar	23
Sindh	25
Single-edged Knife	94,243
Sinus	270,293,294
Skins	192
Sling Bandage	173
Smellie,	167
Smoking	143,144
Snake-bite	150,185,199,237,344
— charmers	198
— Works on	351
— hood like Rods	93,97,168
Snell	213

	PAGE.
Soda	355
Sodepore	50
Solanum Nigrum	292
Solomon	344
Solon	341
Soma	66, 68
Soranus	120, 147, 166, 229
Sorrow	212
Soza	355
Spathomele	157, 158
Spatula Probe	157
Specillum	163, 269, 272
— Rectal	97
— Vaginal	97
Spittle	94, 211
Spittoons	36, 317
Splints	193, 195, 196, 283
Spongio Somnifera	60
Spoon	317, 328
— gold	16, 65, 92
— shaped knife	168
— shaped Probe	158, 160, 215
Sprengel	232
St. Andrews	239
Stahl, George Ernest	337
Staphyloma	246
Steel	61, 161
— yard	324
Stein	24
Stems	293
St. Germain-en-Laye	163
Sticks	306
Still-born	198, 308
Stone	68, 94, 128, 160, 162, 197, 198, 310, 316, 325, 327
— Extraction of	168

	PAGE.
Stool, Operation—	86
Strabo	... xiv 343, 344
Strainer	... 312, 319
Stricture dilators	125
Strychnos Nux Vomica	359
— Potatorum	359
Studies in the Medicine of Ancient India	5
Styptics	223
Substitutes for cutting instruments	282
Sucking-horn	357
Suction	149
— Apparatus	204
Sugar	204, 355
Sukkur	355
Sulphuret of Arsenic	355
Sundul	355
Supporter Bandage	178
Suppuration	98, 262
Suqrat	347
Surat	50
Surgical Emergencies	207
— Instruments	14
— Operations...	14
— operations, practical training of	280
Suspension Apparatus	194
Suture	205, 243
— Sling-like	209
— varicties of	209
— Material	208
Swabs	93
— Probes	157
Swain	207
Sweet cane of Scripture	346
Sword-shaped cautery	218

				PAGE.
Sylvain	...	...	...	6
Sylvius	...	...	...	337
Symon Set	...	...	...	346
Syphilis	...	...	...	32
System of Medicine	...	...	...	329

T

Tabosheer	...	...	...	354
Tail-Bandage	...	...	...	177
Takakusu	...	...	...	19
Tamar Hind	...	...	...	356
Tamarinds	...	...	...	356
Tamarindus Indica	...	...	...	354
Tambapani	...	...	...	47
Tamuarin	...	...	...	356
Tangore Catalogue	...	...	...	5
Tanjur	...	...	...	23
Tapping	...	...	...	281
Tārakeśvar	...	...	...	ix
Tashi Lama	...	...	...	357
Tatanagum	...	...	...	355
Tectonia Grandis	...	...	...	291
Tembul	...	...	...	354
Tempering	...	...	...	70
Temple-Sleep	...	...	...	ix
Tenaculum	...	...	...	266
Tendrils	...	...	...	177, 189
Tents	...	...	117, 175, 181, 220, 322	322
Terminalia Bellerica	...	...	...	37
— Chebula	...	...	...	130, 361
Teta	...	...	...	340
The Authorship of Caraka Saṁhita	...	...	...	5
The Invasion of Alexander the Great	...	...	...	xiv

	PAGE.
Theodosic	60
Theophrastus	343
Things Indian	50
Thomas	162
Thot	340
Thread	94, 175
Three faced	95
Throat Speculum	96, 109
Thucydides	vi
Tibet	356
Tibetan Block Prints	357
— Surgical Instruments	356
Tiger Forceps	102
Tiger's Claws	99
Timæus	341
Time	98
Tin	... 63, 122, 343
Tincal	355
Tinkar	355
Tinospora Cordifolia	359
Tob Chini	32
Tongue	94, 203
— Scraper	299, 300
Tonsil	254, 265, 266
— Operation of	226
Tooth	... 94, 216, 268
— False	269
— Loose	268, 294
— Wisdom	268
— Ache	299
— Brush	207, 295, 296, 299
— Cleaner	298
— Elevator	170
— Extraction	171, 268, 269
— Extractor	97

		PAGE.
Tooth Pick	...	95, 297, 299
— Powder	...	295
— sealer	...	70, 204, 267
— wood	...	297
Tootum	...	355
Toryne	...	254
Tosorthros	...	340
Toy Cart	...	35
Traction Hook	...	165
Transactions of the Royal Asiatic Society	...	346
Treatise on Midwifery	...	167
Trec and Serpent Worship	...	159, 235, 324
Trepan	...	232
Trephine	...	231, 232
Triehiasis,	...	66, 105, 218, 228, 246
Trifolia	...	354
Trivalve Speculum	...	120
Troear	...	261
Tryphala parva	...	354
Tryphalla	...	354
Tsae-urh	...	298
Tsâng-urh	...	298
Tube	...	121, 122, 129, 131, 132
— Defects of	...	133, 134
Tubular Instruments	...	91, 93, 96, 108
————— for Aseites	...	122
————— of Cupping	...	148
————— for Fistula-in-Ano.	...	114
————— for Fumigations	...	140
————— for Hydrocele	...	123
————— for Inhalations	...	140
————— for Injections in the	...	—
————— Reetum	...	125
————— for Inspection of Arrows	...	111
————— for Nose	...	115

	PAGE.
Tubular Instruments for Piles ...	112
————— for Rectal Stricture ...	124
————— for Urethra ...	135
————— for Urethral Stricture ...	123
————— for Uterus ...	138
————— for Vagina ...	138
————— for Wounds ...	121
Tuj ...	354
Tumbol ...	355
Tunbol ...	355
Turbans ...	305
Turpeth ...	354
Turtullian ...	240
Tutenagum ...	355
Tutia ...	355
Tuthy ...	355
Twine ...	94, 176
Typha ...	254

U

Umbrellas ...	306
Urethral Probe ...	136, 174
———— Syringe ...	138
———— Tubes ...	135
Urginea Indica, ...	361
———— Jambolana ...	38
Urinal ...	36, 317
Uterine Clysters ...	138
———— Medication, ...	139
———— Tube ...	135, 138, 139
Uvula ...	265

V

Vaghata et L'Astangahrdaya Samhita ...	24, 27
--	--------

				PAGE.
Vaginal Clyster	...	...	...	138
Vaginal Speculum	...	...	97, 119, 120, 342	
— Tubes	...	...	...	135, 138
Valeriana Hardwicki	...	...	...	360
Vānumati ...	...	...	...	17, 31
Vapour-bath	...	...	... 68, 182, 322	
Variola ...	...	...	...	356
Vessels, Puncturing of	...	...	...	255, 264
Vasti-yantra	...	...	...	36, 67, 86
Vata-Rakta ...	...	...	...	9
Vegetius ...	...	...	...	260
Velpeau ...	...	...	...	215
Venesection ...	...	...	...	256
Verole ...	...	...	...	356
Veterinary Art	...	...	257, 351, 352	
Virgil ...	...	...	...	343
Visa-Vaidya ...	...	...	...	111, 45
Vitis Vinifera	...	...	...	37
Vṛddha Trayi	...	...	...	19, 21
Vullurs ...	...	...	...	17
Vulsellum ...	...	...	...	266
Vulture Forceps	...	...	...	103

W

Walsh ...	...	...	...	356
Waring ...	...	...	...	245
Warts ...	...	...	...	242
Watanbe ...	...	...	...	357
Water, cooling of	...	...	...	311
Water, Impure	...	...	...	312
— Purification of	...	...	...	310

	PAGE.
Water, Seented	314
——— Seasonable	313
——— Touched	312, 313
——— dipper	312
——— Vessel	312
——— Vessel, Stand for	311
Way of Buddha	309, 312
Weber	346, 348, 353
Weighing Scales	36
Weights	324
Wellcome Research Laboratory, Report of	150, 217
Wheat	219
Whetstones	36, 80
Whisker	307
White	257
Whitney	3, 137
Willi	337
Wilson,	V, 10, 64, 320, 331, 353
Winding suture	209
Wine	59
Wise	XV, 254, 330, 347
Withania Somnifera	220
Wolf Forceps	102
Woman-milk	275
Wood	68, 82, 83, 117, 123, 125, 140, 177, 397, 300, 307, 315, 316, 328
Wooden Hand	196
——— Splints	196
Woollen Threads	210
Wounds	291, 292
——— Fumigation	97, 122, 144
——— Syringe	99, 121, 281
Wrightia Antidysenterica	360
Wnstendeld	353
Wuz	355

PAGE.

X

Xarac	350, 354
-------	-----	-----	-----	-----	----------

Y

Yolk's Tail	309
-------------	-----	-----	-----	-----	-----

Z

Zanik	...	...	...	...	352
Zarnach	...	...	...	...	355
Zeit. deut	...	...	...	...	23
Zingiber	...	...	...	...	355
Zinzabill	...	...	...	...	355
Zizyphus Jujube	...	...	...	...	37
Zoology	...	...	...	...	334

INDEX.



SANSKRIT.

A

	PAGE.
Abānimukha	99
Abhayā	37
Abnus	355
A. Catṭopādhyāy	17
A. C. Kaviratna	9, 17
Ācūṣaṇa	75, 76
Adhamulla	32
Adhijihvā	229
Adhyarddhadhāra	98, 243
Agada	2
Agastya	51, 192
Agni	94, 215
Agnidamani	359
Agnika	219
Agniveśa	4, 7, 22, 25, 26
Agniveśatantra	130
Agra-bakra	168
Aguru	355
Āharana	75, 76, 77
Airvvārukamukha	92, 103
Ajakarṇa	359
Ajamoda	359
Ākāsa-gotta	xi
Alābu	97
Alābu-Yantra	150, 342
Alagarddā	288

				PAGE.
Amarāvatī	...	...	...	306
Ambara	...	...	...	355
Ambashthai	...	...	...	360
Āmlakī	...	...	...	37
Amoghavajra	...	...	...	358
Amṛta	...	...	...	220
Anaka	...	...	...	96
Āñicana	...	...	...	75
Aṅguli	...	...	...	94, 199
—Sastra	...	...	...	98, 238, 342
—Yantra	...	...	...	342
Añkuśa	...	...	...	165, 328, 342
—Cautery	...	...	...	160
—vadana	...	...	...	93
Antarmukha	...	...	78, 95, 98, 250, 251	
Antarvalkala	...	...	...	193
Antiochus	...	...	...	47
Anuśastra	...	...	...	282
Anuvellita	...	...	...	177
Anuyantra	...	...	...	98
Ārā	...	...	95, 98, 205, 262, 263, 279	
Archæological Survey of South India		...	...	12, 30
Arddhaeandra	...	...	...	96, 99, 251
—mukha Śalā	...	...	...	171
Arddhacandrānana	...	...	...	98, 251
Arddhadhāra	...	...	...	77, 94, 243
Arddhendu	...	...	...	98
Arhats	...	...	...	345
Arjuna	...	...	...	292
Arka	...	...	...	360
Arkamūla	...	...	...	360
Arunadatta	...	...	...	24, 27, 237
Āśadhaba Sallaxana	...	...	...	28
Āśava	...	...	...	39
Āśmabhālam	...	...	...	318

	PAGE.
Aśmarī	97
Aśoka	... iv, 8, 34, 41, 47, 49, 345
Aṣṭāṅga Hṛdaya Saṁhitā	18, 19, 23, 25, 26, 67, 69, 73, 76, 79, 81, 86, 88, 92, 98, 101, 104, 105, 107, 108, 109, 110, 111, 112, 113, 114, 115, 117, 118, 119, 121, 122, 127, 136, 141, 143, 148, 151, 156, 157, 159, 160, 163, 165, 168, 175, 186, 187, 189, 190, 195, 197, 198, 199, 200, 201, 203, 204, 206, 208, 211, 214, 217, 222, 225, 230, 232, 237, 239, 240, 244, 247, 250, 251, 253, 255, 256, 257, 258, 259, 262, 264, 265, 267, 270, 271, 272, 276, 278, 280, 290, 333
Aṣṭāṅga Hṛdayatikā	28
Aṣṭāṅga Saṅgraha	... ... 18, 23, 24
Aṣṭhilaśma	... ... 94, 197
Asutosh Mookerjee, Hon'ble Justice Sir	... xvi
Āśvabala	... ... 292
Āśvagandhā	... ... 220
Āśvakatāka	... ... 94, 210
Asvavaidyaka	114, 130, 158, 235, 241, 242, 258, 266, 316, 334
Āśvins	... ... 4, 12, 341
Atarusha	... ... 359
Atasi	... ... 39, 359
Atharva Veda	1, 3, 15, 39, 61, 137, 303, 304
Ātī	... ... 249
Ātīmukha	... ... 78, 95, 249
Ātīvadana	... ... 98
Ativisha	... ... 358
Ātreya, Punarvasu	... ... 4, 15, 18, 21, 130
Atri	... ... 353
Aupadhenava	... ... 17
Aurabhra	... ... 17
Avabhanjanamukha	... ... 92, 103
Avantī	... ... 308
Ayaśkānta	... ... 94, 212
Āyurveda	... ... 1, 13, 22, 342
Āyurvedārthadīpikā	... ... 7

PAGE.

B

Bael Fruit	...	...	...	281
Bamśabidala	...	...	...	106
Bakam	...	...	...	360
Bandhana	...	...	...	74, 76
Baptista	...	...	...	60
Barley	...	...	...	41
Behicharlal Nathuram	...	...	...	27
Bhāba Prakāśa	32, 33, 99, 128, 138, 194, 195, 200, 296, 300, 301, 304, 305, 306, 307, 308, 312, 313, 316, 323, 325, 332			
Bhāgavat	...	...	...	16
Bhallātaka	...	...	...	39
Bhāndarkar	...	...	...	6
Bhaīga	...	...	...	76
Bhañjana	...	...	...	75
Bhānumatī	...	...	...	107
Bharadvāja	...	...	...	4
Bhāsamukha	...	...	...	92
Bhāsamukha Forceps	...	...	...	103
Bhāskara	...	...	...	17
Bhāvamiśra v, xiv	22, 99, 128, 193, 194, 195, 200, 295, 299, 300, 301, 304, 305, 306, 307, 308, 312, 313, 323, 324			
Bhedana	...	...	...	77, 80
Bhela	...	...	...	4, 5, 25
Bheṣaja	...	...	...	94, 219
Bhīṣma	...	...	...	ii
Bhoja	60, 230, 231, 232, 248, 249, 254, 257, 262, 264			
Bhoja Prabandha	...	...	...	iii, 60, 231
Bhṛṅgarājamukha	...	...	...	92, 103
Bhūrjja	...	...	...	39
Bhūtvidyā	...	...	...	2
Bihat	...	...	...	63, 162
Bijnor	...	...	...	162

	PAGE.
Bīrājacaran Gupta	5
B. L. Sen	5, 27
Brahmā	1, 4, 12, 22, 301
Bramhadeva	17
Brāhmaṇas	9
Bṛśavadvaja	8
Bucanaka	360
Buddha	ii, XI, 46, 182, 308
Buddhadāsa	49, 50
Buddhaghosha	327

C

Cacyn-nama	355
Cakradatta	29, 30, 31, 62, 66, 67, 124, 126, 128, 141, 143, 161, 162, 164, 173, 175, 176, 183, 185, 189, 190, 200, 201, 218, 222, 227, 228, 229, 245, 248, 253, 255, 258, 323, 327
Cakradhāra	243
Cakrākṛti	96
Cakrapāṇi	41, 125, 164, 204, 259, 265, 271, 282, 292, 350
Cakrapāṇidatta	7, 9, 10, 17, 29, 30, 31, 62, 63, 67, 104, 107, 115, 149, 183
Cakratattwadīpikā	31
Cāla	76
Cālana	75
Chalmugra	360
Cāmara	308
Campaka	310
Candana	354, 355, 359
Candrācandana	28
Candra Gupta	35, 40, 344
Candrakumar Das Kavibhusan	31
Candrātē	16
Candravarga	99

	PAGE.
Canouge	350
Caraka, x, 4, 5, 7, 7, 10, 11, 18, 20, 21, 23, 25, 26, 30, 31, 34, 38, 59, 65, 67, 78, 114, 125, 129, 139, 140, 142, 143, 144, 146, 147, 149, 152, 166, 174, 176, 179, 181, 197, 201, 202, 203, 205, 207, 209, 236, 246, 252, 269, 278, 248, 292, 293, 296, 300, 304, 305, 206, 316, 318, 351, 354	
——— Samhitā 2, 4, 7, 8, 9, 31, 34, 40, 41, 59, 65, 67, 78, 86, 115, 126, 130, 133, 136, 139, 140, 141, 142, 143, 146, 147, 149, 151, 152, 174, 176, 179, 201, 203, 205, 207, 209, 217, 237, 247, 269, 292, 293, 300, 301, 304, 305, 306, 307, 308, 316, 318, 320	
——— Tattva-Pradīpikā	10
Carma	94, 183
Cāsamukha	92, 103
Cashmere	5, 356
Caturvarga Cintāmanī	56
Cavya	39
Chatra	306
Chedana	77, 79
China	358
Chīna	178
Cikitsā Sāra Saṅgraha	30, 31
Cillimukha	92, 103
Ciravilva	39, 219
Citraka	39, 219
Classification of Instruments	90
..	
..	
..	
..	
D	
Dahana	80, 177, 221
Dākodara	97, 122
Dakṣa	4, 12, 341
Dallanācāryya	12, 17, 57, 107, 211, 225, 230, 233, 237, 243, 249
Dāmodara	98, 31

D

Dahana	80, 177, 221
Dākodara	97, 122
Dakṣa	4, 12, 341
Dallanācāryya	12, 17, 57, 107, 211, 225, 230, 233, 237, 243, 249
Dāmodara	98, 31

	PAGE.
Danga ...	356
Danta ...	94, 204
Danta-kāṣṭha	297
—lekhana	98, 267
—śaiku	70, 71, 95, 267
Dāntī ...	219
Dāraṇa	75
Dārila	4
Dārnharidrā ...	359, 360
Darvvi ...	214, 328, 360
Daśaratha ...	16
Datta ...	17, 25, 219, 251, 331
Dvārusita ...	355
Devadāru ...	319, 353, 354
Dhāi ...	218, 282
Dhammapada	84
Dhanian ...	352
Dhanurveda ...	62
Dhanvantari...	11, 12, 14, 352
Dhar ...	232
Dhattura ...	359, 361
Dhatushena ...	50
Dīrghavaktra	233, 240
Divodāsa ...	11
Dravasveda ...	323
Drḍhavala ...	5, 8, 19, 130, 132, 141, 182, 185, 326
Dronī ...	323
Dṛti ...	192
Dvīpimukha	92, 102
Dvitāla ...	93, 96
Dyatūha ...	99

E

Ekatāla ...	93, 96
Elā ...	39, 359

				PAGE.
Enīpada	...	...	...	269
Eraṇda	...	...	...	291, 359
Ervārūka	...	...	...	280
Eṣana	...	...	...	76, 77, 79
Eṣanī	77, 78, 79, 80, 95, 98, 99, 173, 174, 269, 273, 279			

F

Faṇibaktra	97
------------	-----	-----	-----	----

G

Gaṇḍūpadamukha	...	...	...	93, 97, 98
Ganeśkrṣṇa Garde	...	...	...	27
Ganeś Śastré Tartevaidya	...	...	...	27
Gaṅgādhar Kaviratna	...	...	...	9, 10, 20
Garbhaśaiku	...	...	...	97, 165
Gayadāsa	...	...	...	17, 195
Ghatīyantra	...	...	...	97, 151
Gocandana	...	...	...	288
Godhāmukha	...	...	...	95, 99
Goji	...	...	...	282, 291, 292
Golomi	...	...	...	41
Gomedaka	...	...	...	310
Gophaṇā	...	...	...	178
Gophaṇikā	...	...	...	209
Grahanā	...	...	...	80
Grdhramukha	...	...	...	92, 95, 103
Grdhrapada	...	...	...	96
Guḍuci	...	...	...	292, 359
Guggula	...	...	...	41, 354
Gupta	...	...	...	9

H

				PAGE.
Harieandra	...	...	...	10
Haridrā	...	...	...	291, 292
Harikṛṣṇa Sen Mallik	...	...	...	28
Harināth Viśārada	...	...	...	10
Harīta	...	4, 5, 25, 90, 93, 96, 129, 231, 323		
Haritakī	...	...	130, 354, 361	
Haritāla	...	...	...	55
Hārīta Saṁhitā	...	...	104, 251, 283, 323	
Harṣa	...	...	...	94, 212
Haracarita	...	...	...	12
Hastipippalī	...	...	...	39
Hastyāūrveda	...	...	...	15, 99, 130
Hata	...	...	...	328
Hayamāraka	...	...	...	219
Hemādri	...	...	...	28, 54
Hiṅgu	...	...	...	39
Hirendranāth Mukhopādhyāya	...	...	...	XX
Hrasvavaktra	...	...	...	233, 240
Hṛdayabodhikā	...	...	...	38

I

Indra	...	...	...	4, 12
Indravāruṇī	...	...	...	359
Indrayava	...	...	...	360
Indrāyudha	...	...	...	288
Inguda	...	...	...	39, 40
Ispaghula	...	...	...	360

J

Jalavardhanī	...	...	...	249
Jambul	...	...	...	38

				PAGE.
Jāmvavavadana	...	...	...	93
Jāmvovouṣṭha	...	...	97, 99, 159, 217, 234	
Jānumatrāsana	...	...	...	86
Jaṭila	...	...	...	41
Jatukarna	...	...	...	4
Javamukhī	...	...	...	245
—Śalākā	...	...	...	275
Jayacandra	...	...	...	269
Jayadatta Sūri	...	...	114, 158, 235	
Jejjatācāryya	...	...	...	17
Jīvaka	...	...	II, XIII, 231	
Jīvānanda Vidyāsāgara	...	...	9, 17, 21, 27, 33	
Jihvā	...	...	...	94, 203
—kaṇṭaka	...	...	...	229
—nirlekhana	...	...	...	299
Jonivraṇekṣaṇa	...	...	...	119, 120
Jośodānandana Sarkār	...	...	...	9, 28, 31
Jūthikā	...	...	...	263
	

K

Kadalī	...	...	...	354
Kadamba	...	...	...	39, 292
Kākamāeī	...	...	...	292
Kākamukha	...	...	...	92, 103
Kākolyādi	...	...	...	220
Kālādānā	...	...	...	360
Kalasī	...	...	...	311, 322
Kalodaka	...	...	...	313
Kāmadeva	...	...	...	28
Kāmandikya Nītisāra	...	...	...	35, 45, 198
Kanāda	...	...	...	333
Kānakya	...	...	...	352

	PAGE.
Kaniṣka	6, 16
Kanka	353
Kankab	352
Kaṇkamukha	92, 99, 101, 103
Kaṇkapada	96
Kaṇkapatra	96
Kaṇkāyaṇa	353
Kaṇṭhaśalyāvalokiṇī	96, 109
Kapāṭa-śayana	87, 342
Kapila	288
Karanja	359
Karapatra	73, 77, 94, 96, 98, 230, 279, 342
Karapatraka	96
Karavīrakapatraka	96
Karkataka	99
Karmāra	264
Karṇa-śodhana	163
Karṇa-vedhanī	98, 253
Kārpāsa	350
Kartarī	98, 250
Karvura	288
Kārapāṇi	4
Kāsi	347
Kaśmarīpatra	292
Kashmir	313
Kassis	355
Katakaphala	310
Katfala	359
Kaṭhopaniṣada	301
Kapillaka	359
Katuka	361
Katukoshtaki	359
Katurina	359
Kātyāyaṇa	16
Kaumārabhṛtya	2

			PAGE.
Kauśika Sūtra	...	...	4
Kāya Cikitsā	...	...	2
K. C. Sen	..	...	5, 27, 33
Kerala Putra	...	...	47
Keśaprasādhanī	...	...	303
Keśava	..	...	4
Khadira	...	...	354, 358, 30
Khaja	...	...	80, 98, 253
Khal	..	...	68, 158, 180, 327
Khallamukha	...	...	93
Khar	..	...	355
Khāraṇāda	...	...	128, 129
Kharjjūrapatrika	...	...	99
Khatvā	..	...	178
Kikitsa-Vidya	...	...	314
Kilima	..	...	39
Kirata	..	...	359, 360
Kokilākṣa	...	...	360
Kolāsthidalumukha	..	...	93, 97
Kolinjana	..	...	355
Krauñcamukha	..	...	102, 103
Kṛṣṇa	..	...	8, 287
Kṣāra	..	...	94, 213
Kṣura	..	...	234, 235
Kubara	..	...	355
Kulinjana	..	...	353
Kuliśamukha	..	...	99
Kullattha	..	...	37
Kumuda	..	...	292
Kunte	..	...	24, 27
Kuraramukha	..	...	92, 103
Kuravaka	..	...	272
Kuravakaśalā	..	...	98
Kūrcca	..	...	98, 215, 252, 253
Kuśa	..	...	177, 195

PAGE.

Kuśapatra	...	70, 78, 94, 98, 99, 247, 248, 249
Kussas	...	...
Kuṣṭha	...	...
Kuṭhāra	...	...
Kuṭharikā	...	70, 77, 95, 96, 98, 254, 256, 279
Kutṭana	...	...

...

L

Laghumañjuṣā	...	...	...	7
Lakṣmī	...	...	...	8
Lāngoli	...	...	...	39
Laśuna	...	...	...	39
Latā	...	...	...	94, 195
Laṭaka Miśra	...	...	...	32
Lekhana	...	...	...	77, 79
Likhita	...	...	...	193
Lodhravalī	...	...	...	30
Lohārṇava	...	...	...	62
Louhamāraṇa-Vidhi	...	...	...	62

M

Mādhava	...	...	17, 19, 29, 30, 350
Mādhavācāryya	...	...	29
Madhusūdan Gupta	...	...	17
Mahābhārata,	...	...	i, ii 15, 16
Mahānīlata tantra	...	...	ix
Mahāvamśa	...	...	50
Maheśvara	...	...	10
Mahosadha	...	...	338
Maireya	...	...	39
Makaraka	...	...	99

				PAGE.
Makaramukha	...	....	...	102
Makha-deva jataka	....	....	...	105
Mālatipuśpavṛṇṭāgra	....	....	...	93
Mālavikāgnimitra	....	....	...	iii
Mallaka Saṁpuṭa	...	....	...	143
Mals	...	....	...	277
Mānadaṇḍa	...	...	...	324
Mandala	...	...	...	177
Māṇdalāgra	70, 77, 79, 94, 98, 99, 165, 225, 226, 227, 228,			
				230, 239, 260, 279
Maṇḍukparṇī	...	....	...	39
Mañji ṭhā	...	....	...	130
Manka	...	....	...	352
Mankba	...	....	...	352
Mānosāra	...	...	...	39
Manaśilā	...	...	...	355
Manthana	...	...	...	80
Manusamhitā	...	iii, iv, viii, 65, 191, 192, 193, 353		
Mārga Viśodhana	....	...	...	75, 76
Mārjāramukha	....	....	...	92, 102
Māṣa	...	...	...	37, 189
Maṣaka	...	...	...	191
Māsha	...	...	...	219
Masūradalabaktra	...	...	...	97
Masūradalamukha	...	...	...	93
Masurikā	....	...	...	356
Mātuluṅga	...	...	...	354
Mahāvagga, ii, xi, 45, 46, 82, 116, 182, 231, 308, 316, 319,				
				320, 327
Mṛganābhi	....	....	...	354
Mucuṇḍī	...	....	...	106
Mucuṭī	...	....	...	69, 96, 105, 106
Mudga	...	....	...	37
Mudgara	...	....	...	94, 96, 198
Mudrikā	...	....	...	77, 94, 165, 238, 342

				PAGE.
Mukha	...	...	...	94, 205
Muktābali	...	...	...	31
Muktabarśi	...	...	...	360
Mukulāgra	...	...	...	93
Mulaka	...	...	...	219
Muñja	...	...	...	283
Muñjavalaya	...	...	...	311
Muṣala	...	...	...	172, 318
Mūṣika	...	...	...	288

N

Nādī	...	...	...	91, 93, 96, 108
Nāgadamanī	...	...	...	353
Nāgakesara	...	...	...	310
Nagara	...	...	...	39
Nāgarāṅga	...	...	...	354, 360
Nāgārjūna	...	...	...	16, 6I, 298
Nagorekote	...	...	...	352
Nāgeśa Bhaṭṭa	...	...	...	7
Nakha	...	...	...	94, 204
Nakhaśastra	...	...	70, 77, 79, 94, 98,	237
Nālī	...	...	...	264
Nāmana	...	...	...	76
Nandimukhamukha	...	...	...	92, 99, 103
Nandipurāṇa	...	...	...	52
Nārāyaṇa	...	...	...	30
Natthukaraṇī	...	...	...	84, 116
Navā Vihara	...	...	...	35I
Nayapala	...	...	...	30
Nibandha Saṅgraha	17, 107, 148, 151, 196, 211, 225, 230, 233, 237, 243, 247, 249, 250, 255, 257, 264, 263, 264, 265, 267			
Nidāna	...	...	...	29, 30

				PAGE.
Nimba	..	...	...	354, 360, 292
Nimi	..	...	...	14
Nirghātana	..	...	...	74, 76
Nirmālāya	..	...	...	310
Nītisāra	..	...	...	35, 45, 198
Nāya	..	...	...	9
Nāya Candrikā	..	...	...	17

O

Oṣadhadhāraka	338
---------------	-----	-----	-----	-----

P

Pācana	..	...	...	221
Padārthacandrikā	..	...	...	28
Padatala	..	...	...	94
Paippalada	..	...	...	3
Paitāmoha Sidhyānta	..	...	...	348
Pālakāpya	16, 90, 99, 102, 122, 130, 229, 235, 238, 241, 246, ..	247, 248, 256, 261, 264, 266, 269, 273, 334		
Palasha	..	...	...	359
Pañcabaktra	..	...	...	96
Pañcamukha	..	...	...	110
Pañcaṅgī	..	...	...	179
Pañcasidhantica	..	...	...	347
Pāṇimantha	..	...	...	205, 202
Pāṇini	..	...	...	7, 8
Panipadatala	..	...	...	199
Panitala	..	...	...	94
Pañjikā	..	...	...	17
Paramaka	..	...	...	351
Parāśara	..	...	...	4

	PAGE.
Parisrāvana	312
Parusa	37
Pāśa	187
Paṭala	310
Paṭalī	292
Pātaliputra	345
Pāṭana	78, 79
Pataṅga	360
Patañjali	7, 10, 62
Pāṭhya	28
Patṭa	94, 176
Paulisa	348
Pavitra	320
Phalaka	310
Phalavarti	175
Pīḍana	75, 76
Pilindavakkha	84
Piṅgala	288
Pipe	85
Pippali	39, 216, 292, 355
Piṣana paṭa	327
Piṣsana-śilā	327
Piyadasi	47
Palāṇdu	358
Pouṣkalāvata	17
Pradhamana	76
Pradīpa	28
Prakṣālaṇa	76
Pramārjana	76
Pratuda	279
Pravāhaṇa	94, 211
Pracchāna	79
Pramārjana	93
Pratoli	177
Prubhurām Jibnarām	17

				PAGE.
Pundarikamukhi	...	...	...	288
Pūraṇa	...	...	...	74, 76
Puṣpanetra	...	...	...	135, 136
Pyārimohan Sengupta	...	...	...	31

R

Rājavallabha	...	...	...	309
Rajju	...	...	...	94, 175
Rājśāḍava	...	...	...	316
Rājatarāñginī	...	...	...	16, 24
Rāma	...	...	...	11, 16
Ramānāth Vaidya	...	...	...	28
Rampaka	...	...	...	99, 238
Ram Raz	...	...	...	39
Rasiārṇava	...	...	...	28
Rasāyana	...	...	...	2
Rasik Lāl Gupta	...	...	...	33
Ray	...	...	6, 24, 28, 290, 350	350
Rgveda	1, 2, 61, 62, 64, 68, 80, 191, 192, 301, 318, 319, 338			
Rjugranthi	...	...	...	209
Rjukaraṇa	...	...	...	76
Rkṣamukha	...	...	...	92, 102
R. L. Mitra	IV	...	62, 192, 193, 196, 304, 305	
Rabi Dutta	...	...	...	27
Romaka	...	...	...	348
Romapāda	...	...	...	16
R. R. S.	...	...	...	28

S

Saleh	...	...	...	...	352
Sāhasāṅka	...	...	...	...	10
Sāhasāṅkacarita	...	...	...	...	10

				PAGE.
Śaivālamula,	...	...	...	310
Sajika	...	...	...	355
Saka	...	...	...	291
Śākhā	...	...	...	94,282,291
Śākyā Muni	...	...	...	8
Śalākā	...	...	91,93,96,97,99,155,215,216	
Śālākya Tantra	...	...	...	2
Sālotar	...	...	...	352
Śalya	...	...	...	91
Śalyanirghātānī	...	...	74,96,111,198,199	
Śalya Tantra	...	...	...	2,14
Sādāsi	...	...	...	106
Śamī	...	...	...	96,113
Sammohinī	...	...	...	60
Śāmudrikā	...	...	...	288
Samvuhana	...	...	...	76
Sana	...	...	...	219
Sanasrad	...	...	...	290
Sanchi	...	...	...	306
Sanchi Topes	...	...	...	327
Sandamśa	...	80,91,92,95,96,103,104,105,106,232		
Sandaracha	...	...	...	155
Sandhāna	...	...	...	221
Saṅghapāla	...	...	...	358
Sañjibānī	...	...	...	60
Śaṅkarācāryya	...	...	...	XIII
Śaṅkara Miśra	...	...	...	213
Śaṅkaravijaya	...	...	...	XIII
Saṅketamanjarī	...	...	...	28
Śaṅkha	...	...	...	210
Śaṅku	...	...	...	97,156
Śaṅkumukhī	...	...	...	288
Saptaparna	...	...	...	359
Sarad	...	...	...	18
Sarala	...	...	...	219

				PAGE.
Śarapuṇkhamukha	...	...	...	93,97
Sarāba Saṅpuṭa	...	...	...	143
Śararī	...	...	...	249
Śararīmukha	...	...	...	78,95,98,249
Śararīmukha Probe	...	...	...	171
Śārddūlamuṣṭhika	...	...	...	99
Sarjarasa	...	...	...	219
Sarkarā	...	...	...	355
Śārṅgadhara	31,66,68,115,122,128,140,142,143,144,145,147, 162,175,188,235,286,294,322,323,333.			
Śārṅgadharapaddhati	...	...	...	62
Śārṅgadhara Saṅgraha	31,66,67,68,115,122,128,138,140,142, 145,147,162,175,188,235,136,286,322,323,333.			
Śārṅgadharatīkā	...	...	...	32
Sarpavidyā	...	...	...	351
Sarpaphaṇamukha	...	...	...	93,168
Sarpāsyā	...	...	...	98,277,278
Sarṣapa	...	...	...	39
Sarvadarśana Saṅgraha	...	...	...	29
Sarvāṅga Sundarī	...	...	...	27,118,225,237
Śaśaghātīmukha	...	...	...	92,103
Śastras	...	...	...	90,94,160,225
Śatapatha Brāhmaṇa	...	...	...	164,301
Śatapuṣpa	...	...	...	359
Śaṭṭaka	...	...	...	316
Satyaputra	...	...	...	47
Saubatsika	...	...	...	96
Saura Siddhīnta	...	...	...	348
Savarikā	...	...	...	288
Sāvitrī	...	...	...	303
Sāyaṇa	...	...	...	29,64
Sāyaṇa's Commentary,	.			I
S. C. Das	...	...	...	30
Sermicarpus Anacardeum	...	...	...	219

	PAGE.
Śephālikā ...	... 282,291,293
Śibadāsa ...	10,30,31,62,227,293
Siddhayoga ...	... 29,30,184
Śigru ...	... 219
Śikya ...	... 311
Śilāditya ...	... II, 47,49
Śimhadaiñstrā ...	... 99
Śimha Gupta ...	... 25,21
Śimhamuka ...	... 92,96,101
Śirovasti ...	... 188
Śivana ...	... 78,79
Skandana ...	... 221
Skanda Purāṇa ...	... 55
Soma ...	... 220,303,318
Sonāmukhī ...	... 353,359
Sonnā ...	... 106
Sphoṭaka ...	... 356
Śramaṇa ...	... 345
Śramaneris ...	... 303
Śṛgālamukha ...	... 92,102
Śribatsa,	... 96
Śrikanṭha	... 124
Śrīveṣṭaka	... 219
Śringa	... 96, 148, 151, 205, 342
Śrīgavera	... 355
Śrutavimśatikotī	... 48
Sruva	... 103, 164
Sthagikā	... 178
Sṭhīvana	... 94, 211
Sūci	77, 78, 79, 94, 96, 98, 99, 243
Sūeīmukha	... 98, 99, 342
Sugandha Marica	... 353
Sukti	... 326
Śūlī	... 96
Surat Hospital	... 50

PAGE.

Suśruta IX,X,	2, 5, 6, 11, 12, 13, 74, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 28, 30, 31, 38, 42, 43, 57, 58, 59, 61, 63, 64, 65, 66, 67, 68, 69, 70, 73, 74, 77, 80, 86, 90, 91, 98, 106, 190, 111, 112, 114, 117, 118, 122, 123, 124, 126, 135, 138, 140, 143, 144, 145, 147, 148, 149, 150, 157, 161, 166, 168, 170, 171, 172, 173, 176, 179, 180, 184, 186, 188, 193, 194, 195, 197, 198, 199, 200, 201, 203, 204, 205, 206, 209, 213, 214, 215, 216, 218, 219, 220, 221, 222, 223, 226, 230, 234, 237, 245, 249, 250, 252, 257, 259, 262, 263, 265, 267, 268, 269, 271, 273, 274, 279, 280, 290, 291, 292, 293, 295, 297, 299, 300, 303, 305, 306, 307, 308, 310, 312, 315, 322, 325, 326, 346, 350. 358.		
Suśruta Saṃhitā	1, 2, 11, 12, 13, 14, 16, 17, 19, 31, 38, 42, 44, 57, 58, 59, 61, 63, 64, 65, 66, 67, 68, 69, 70, 73, 74, 77, 80, 86, 87, 91, 92, 100, 101, 103, 106, 107, 108, 109, 114 117, 118, 121, 122, 123, 224, 133, 134, 135, 139, 141, 143, 145, 146, 147, 148, 149, 150, 151, 155, 161, 165, 168, 170, 172, 173, 175, 176, 178, 179, 180, 182, 185, 186, 187, 188, 190, 193, 194, 195, 196, 197, 198, 200, 201, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 216, 218, 222, 223, 226, 227, 234, 237, 238, 243, 245, 249, 257, 259, 263, 265, 269, 270, 271, 213, 274, 279, 280, 282, 283, 286, 291, 292, 293, 294, 295, 297, 299, 300, 304, 305, 306, 307, 308, 310, 311, 312, 315, 318, 320, 321, 324, 325, 326, 332, 333, 355, 336, 343, 362.		
Suvarnakha	...	...	353
Svastika Bandage			
Svastika Yantras	...	...91, 92, 96, 100, 101, 177	
Śyenamukha	...	...	92, 103

T

Tāgara	...	...	...	360
Taittirīya Brahmaṇa	...	...	...	195
Tāla	...	...	...	91, 93, 96

			PAGE.
Tāla Yantra	...	...	106
Talipot	...	...	309
Talponi	...	...	309
Tamālpatra	...	...	354
Tāmbūl	...	...	354, 355, 360
Tanjore Library	...	...	5
Tantras	...	...	336
Tapasveda	...	...	321
Tarakṣumukha	...	...	92, 102
Tathāgata	...	...	308
Tattva Candrikā	...	...	227, 229, 253, 293
Tejapatra	...	..	354
Tejpāt	...	...	346
Thakore Saheb	...	...	XV, 29, 331, 358
Tila	...	...	361
Tincana	...	...	355
Tinduka	...	...	39, 40
Tintīḍī	...	...	354, 356
Tīsaṭa	...	...	16
Trapuṣa	...	...	280
Tribaktra	...	...	95
Trikurccaka	...	...	78, 95, 98, 251, 279
Trimukha	...	...	110
Triphalā	...	...	354
Tripiṭaka	...	...	6
Trivit	...	...	354, 360
Tryastaka	...	...	311
Tūlā	...	...	324
Tunna Sevanī	...	...	209
Tuttha	...	...	355
Tvaka-kshira	...	...	354

U

Ubhalta	...	...	17
Udakamañcikā	...	...	311

PAGE.

Ulūkamukha	...	...	...	92
Ulūkamukha Forceps	...	...	...	103
Ulukhala	...	...	...	318
Umeścandra Gupta	...	...	...	24
Undurkarnika	...	...	...	359
Unmathana	...	...	...	75
Unnamana	...	...	...	75, 76
Upānaha	...	...	...	307
Upānahasveda	...	...	...	323
Upaskara	...	...	...	213
Upatisso	...	...	...	49
Upaveda	...	...	...	1
Upayantra	...	...	...	91, 94, 175
Uṣanas	...	...	...	72
Ushira	...	...	...	359
Uṣīra	...	...	...	284
Uṣṇasveda	...	...	...	321
Uṣṇīṣa	...	...	...	305
Utkula	...	...	...	196
Utpala	...	...	...	310, 345
Utpalapatra	...	77, 94, 98, 99, 240, 241, 242, 258		
Utpātana	...	...	...	79, 345
Uttara Tantra	...	...	...	12, 13, 24
Uttara-Vasti	...	...	...	121, 135, 138, 139

V

Vāca	...	...	...	39, 41, 355
Vaḍīṣa	70, 77, 93, 95, 96, 97, 98, 98, 207, 264, 261			
Vāgbhata	...	...	...	5, 6, 7

PAGE.

Vāgbhaṭa I (Elder) ...	18, 19, 20, 21, 22, 23, 24, 25, 31			
Vāgbhaṭa II (Younger) 18, 19, 20, 21, 22, 23, 24, 25, 26, 28,				
31, 67, 69, 73, 76, 79, 86, 88, 90, 96, 98, 104, 109, 113,				
114, 117, 127, 136, 141, 143, 144, 148, 151, 156, 159, 160,				
166, 186, 187, 189, 190, 195, 197, 198, 199, 200, 201, 203,				
204, 206, 211, 212, 214, 220, 222, 225, 230, 232, 237, 238,				
239, 243, 247, 250, 252, 253, 255, 256, 257, 258, 259, 262,				
267, 271, 272, 276, 277, 280, 289				
Vāgbhaṭa, III				28
Vāgbhaṭārtha Kaumudī 28, 67, 81, 118, 119, 121, 197, 203,				
205, 211, 212, 223, 225, 231, 233, 237, 239, 240, 244, 247,				
250, 251, 253, 255, 259, 263, 264, 265, 267, 270, 271, 272,				
				278
Vaidyaka				71
Vaidyakaśabdāśindhu				24
Vairocana				356
Vaiśeṣika Darśanam				212
Vaiśeṣiki				9
Vājasenīya Saṃhitā				195
Vājikaraṇa				2
Vajramukha				95
Vāla				94, 205
Vālaprabodhikā				28
Valkala				94
Vallāla				60, 231
Vallija				39
Vallūki				148, 151
Vālu				12
Vanapalāṇḍu				361
Vanauṣadhi Darpana				5
Vānu				30
Varāhamihira				347
Vartana				74
Vārttikas				16
Varuṇa				39

			PAGE.
Vaśiṣṭha	...	...	348
Vaśiṣṭha Siddhānta	...	...	348
Vasti Yantra	...	...	97, 99, 125, 137, 342
Vastra	...	...	94, 197
Vāsudeva	...	...	8
Vata	...	...	292
Vatsadanta	...	...	99, 256
Vāvvula	...	...	360
Vayasthā	...	...	41
Vāyu	...	...	303
Vedana	...	...	77
Vellitaka	...	...	209
Venikā	...	...	94, 176
Vetasa	...	...	98
Vetaspatra	...	...	77, 80, 95, 98, 264
Vibhītaka	...	...	37
Viṅga	...	...	39, 360
Vijayratna Sen Gupta	...	...	26, 27
Vikarṣana	...	...	75
Vikramāditya	...	...	49
Vikula	...	...	196
Vilva	...	...	38, 268, 354, 360
Vimbi	...	...	268
Vināmana	...	...	75
Vinaya Saṅgraha	...	...	303
Vīracintāmaṇi	...	...	62
Vīrasvamī	...	...	17
Viṣagranthi	...	...	310
Viṣakha	...	...	46
Viṣamuṣṭi	...	...	354
Viṣa-pāthara	...	...	198
Viṣavaidya	...	...	351
Viṣravaṇa	...	...	78
Viśvāmitra	...	...	11, 14, 15, 51
Viśvaprakāśa	...	...	10

	PAGE.
Vitāna	178
Vivarana	75
Vivartana	75
Vraṇa	356
Vraṇa-vasti	97, 121
Vṛddha Saṅgadhabra	70, 71
Vṛddha Suśruta	14
Vṛddhipatra	70, 77, 79, 94, 98, 99, 226, 232, 234, 235, 241, 279
Vṛhadāraṇyaka	81
Vṛhat Saṁhitā	72
Vṛhibaktra	98
Vṛhimukha	77, 95, 96, 99, 123, 256, 257, 258, 259, 279
Vṛkamukha	92, 102
Vṛnda Mādhava	29, 30, 184
Vyādhana	77, 78, 80
Vyāghramukha	92, 102
Vyājanī	308
Vyākhyā Kusumāvalī	124
Vyāvartana	76
Vyūhana	74

Y

Yājñavalkya	20, 21
Yajurveda	195, 301
Yamaka	178
Yamaka-natthu-karanī	85, 119
Yantras	90, 100
Yantra-Saṭaka	185, 186, 342
Yaṣṭi	306
Yaṣṭi-yantra	99
Yava	37, 265

	PAGE.
Yavana	348
Yavāsa	359
Yogaratnākara	66, 124, 148, 151, 162, 168, 174, 185, 189, 194,
	208, 248, 259, 271
Yoni-vraṇekṣaṇa	97, 342
Yudhiṣṭhira	21
Yujñā-śauku	166

